

Yukon Management Area Annual Report, 2021

by

Shane R. Ransbury

Sam K. S. Decker

Deena M. Jallen

Christy M. Gleason

Bonnie M. Borba

Fred W. West

Joshua N. Clark

Andy J. Padilla

James D. Smith

and

Lacey N. Forsythe

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Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code		all standard mathematical signs, symbols and abbreviations	
deciliter	dL		AAC		
gram	g	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H _A
hectare	ha			base of natural logarithm	e
kilogram	kg	all commonly accepted		catch per unit effort	CPUE
kilometer	km	professional titles	e.g., Dr., Ph.D., R.N., etc.	coefficient of variation	CV
liter	L			common test statistics	(F, t, χ^2 , etc.)
meter	m	at	@	confidence interval	CI
milliliter	mL	compass directions:		correlation coefficient (multiple)	R
millimeter	mm	east	E	correlation coefficient (simple)	r
Weights and measures (English)		north	N	covariance	cov
cubic feet per second	ft ³ /s	south	S	degree (angular)	°
foot	ft	west	W	degrees of freedom	df
gallon	gal	copyright	©	expected value	E
inch	in	corporate suffixes:		greater than	>
mile	mi	Company	Co.	greater than or equal to	≥
nautical mile	nmi	Corporation	Corp.	harvest per unit effort	HPUE
ounce	oz	Incorporated	Inc.	less than	<
pound	lb	Limited	Ltd.	less than or equal to	≤
quart	qt	District of Columbia	D.C.	logarithm (natural)	ln
yard	yd	et alii (and others)	et al.	logarithm (base 10)	log
Time and temperature		et cetera (and so forth)	etc.	logarithm (specify base)	log ₂ , etc.
day	d	exempli gratia (for example)	e.g.	minute (angular)	'
degrees Celsius	°C	Federal Information Code	FIC	not significant	NS
degrees Fahrenheit	°F	id est (that is)	i.e.	null hypothesis	H ₀
degrees kelvin	K	latitude or longitude	lat or long	percent	%
hour	h	monetary symbols (U.S.)	\$, ¢	probability	P
minute	min	months (tables and figures): first three		probability of a type I error (rejection of the null hypothesis when true)	α
second	s	letters	Jan,...,Dec	probability of a type II error (acceptance of the null hypothesis when false)	β
Physics and chemistry		registered trademark	®	second (angular)	"
all atomic symbols		trademark	™	standard deviation	SD
alternating current	AC	United States (adjective)	U.S.	standard error	SE
ampere	A	United States of America (noun)	USA	variance	
calorie	cal	U.S.C.	United States Code	population sample	Var var
direct current	DC	U.S. state	use two-letter abbreviations (e.g., AK, WA)		
hertz	Hz				
horsepower	hp				
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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YUKON MANAGEMENT AREA ANNUAL REPORT, 2021

by

Shane R. Ransbury, Sam K. S. Decker, Deena M. Jallen, Christy M. Gleason, Bonnie M. Borba, Andy J. Padilla,
James D. Smith, and Lacey N. Forsythe

Alaska Department of Fish and Game, Division of Commercial Fisheries, Fairbanks
and

Fred W. West and Joshua N. Clark
Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

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*Shane R. Ransbury, Sam K. S. Decker, Deena M. Jallen, Christy M. Gleason, Bonnie M. Borba, Andy J. Padilla,
James D. Smith, and Lacey N. Forsythe,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
1300 College Rd, Fairbanks, AK 99701-1599, USA*

and

*Fred W. West and Joshua N. Clark,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
333 Raspberry Rd., Anchorage, AK 99518-1599, USA*

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ABSTRACT

The 2021 Yukon management report summarizes the management activities of the Alaska Department of Fish and Game, Division of Commercial Fisheries in the Yukon management area of Alaska. This report provides the 2021 salmon stock status for the Yukon management area, including the preseason outlook and historical data, and provides data on the use of salmon species by commercial, subsistence (Aboriginal), personal use (domestic), and sport (public angling) fisheries. Alaska and Canada fisheries are summarized because the Yukon River is a transboundary river. The report compiles summaries of selected Yukon River projects; complete documentation of these projects and results may appear in separate reports. Fisheries data in this report supersede information presented in previous annual management reports. Some of the data presented are preliminary and may be presented with minor differences in future reports. The Yukon management area report is organized into the following sections: (1) *Salmon Fisheries* presents an area description, fishery resources, and management practices, along with a comprehensive report of the 2021 salmon fisheries, by summer and fall season and compares 2021 runs with previous years; (2) *Other Marine and Freshwater Finfish Fisheries* presents a description of the whitefish and lamprey fisheries; and (3) the *Cape Romanzof District Herring Fishery*.

Keywords Chinook salmon, *Oncorhynchus tshawytscha*, chum salmon, *Oncorhynchus keta*, coho salmon, *Oncorhynchus kisutch*, Pacific herring, *Clupea pallasii*, whitefish, *Coregonus*, Arctic lamprey, *Lethenteron camtschaticum*, Yukon River Salmon Agreement escapement, commercial harvest, subsistence harvest, season outlook, Yukon River, Yukon management area

INTRODUCTION

The Division of Commercial Fisheries of the Alaska Department of Fish and Game (ADF&G) is responsible for the management of Alaska subsistence, personal use, and commercial fisheries in the Yukon management area. This annual report details the activities of ADF&G in the Yukon management area during 2021.

The Yukon management area includes all waters of the Yukon River drainage in Alaska and all coastal waters of Alaska from Point Romanof southward to the Naskonat Peninsula (Figure 1).

SALMON FISHERIES

DESCRIPTION OF AREA AND DISTRICT BOUNDARIES

The Yukon River is the largest river in Alaska and the fifth-largest drainage in North America. The river originates in British Columbia, Canada, within 30 miles of the Gulf of Alaska, and flows over 3,190 km (1,980 mi) through Yukon Territory, Canada, and Alaska, United States, before emptying into the Bering Sea at the Yukon–Kuskokwim Delta. It drains an area of approximately 832,700 km² (321,500 mi²), of which 195,200 mi² lies within Alaska. Except for a few fish taken in the adjacent coastal waters near the mouth, only salmon of Yukon River origin are harvested in the Yukon management area.

Excluding the greater Fairbanks area (an estimated 97,740 residents), there are nearly 22,380 rural residents in the Alaska portion of the drainage (Hunsinger 2018), the majority of whom reside in 43 small communities scattered along the coast and major river systems. Most of these people depend, to varying degrees, on fish and game resources for their livelihood.

When fish returns are strong, commercial salmon fishing is allowed along the entire 1,200-mile length of the mainstem Yukon River in Alaska, the lower 225 miles of the Tanana River, and the lower 12 miles of the Anvik River. The Yukon management area is divided into 7 districts and 10 subdistricts for management and regulatory purposes (Figure 2). The Coastal District, which is divided into Southern and Northern areas, is the area from Naskonat Peninsula to a point 1 mile south of the mouth of the Black River and includes all waters extending 3 nautical miles from any

grassland (Appendix E6). The northern portion of the Coastal District is sometimes managed as part of District 1. The Set Gillnet Only Area is a fall season commercial fishing area in District 1 where only set gillnets are allowed (Appendix E7). For reporting purposes, the lower Yukon management area includes the Coastal District and Districts 1, 2, and 3 (Appendices E8–E10) to a point near Old Paradise Village at river mile 301. The upper Yukon management area includes Districts 4, 5, and 6, and is that portion of the Yukon River drainage upstream of a point near Old Paradise Village at river mile 301 to the Canada border (Appendices E11–E13). Subdistrict 5D is divided into 3 areas (lower, middle, upper) for management purposes (Appendix E14). Additional fishing areas include the Fairbanks Nonsubsistence Area (Appendix E15) and the Anvik River (Appendix E16). The districts and subdistricts are divided into 31 statistical areas for management and reporting purposes.

In addition to the U.S. fisheries, Aboriginal, commercial, sport, and domestic salmon fisheries occur in the Canada portion of the Yukon River drainage. The Department of Fisheries and Oceans, Canada (DFO) conducts the corresponding fishery management activities. Details about fisheries management in the Canada portion of the Yukon River drainage can be found in the annual Yukon River Panel Joint Technical Committee (JTC) reports (e.g., JTC 2022).

FISHERY RESOURCES

Five species of Pacific salmon are found in the Yukon River drainage: Chinook salmon *Oncorhynchus tshawytscha*, chum salmon *O. keta*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, and sockeye salmon *O. nerka*.

Yukon River Chinook salmon have the longest spawning migration of any salmon. Spawning populations of Chinook salmon have been documented throughout the Yukon River drainage from the Archuelinguk River, located approximately 80 miles from the mouth, to nearly 2,000 miles upstream at the headwaters of the drainage in Canada. Chinook salmon begin entering the mouth of the Yukon River after ice breakup in late May or early June and continue to migrate upriver through mid-July.

Chum salmon returns are made up of 2 genetically distinct runs: an early summer chum salmon run and a later fall chum salmon run. Summer chum salmon are characterized by earlier run timing (enter the Yukon River from early June to mid-July), rapid maturation in freshwater, and smaller body size (average weight is 6 to 7 pounds). Summer chum salmon spawn primarily in runoff streams in the lower 700 miles of the Yukon River drainage and in the Tanana River drainage. Fall chum salmon exhibit later run timing (entering the Yukon River from mid-July to early September), a more robust body shape, and a larger body size (average weight is 7 to 8 pounds). Fall chum salmon primarily spawn in the upper portion of the drainage in spring-fed streams. Major fall chum salmon spawning areas include the Tanana, Porcupine, and Teedriinjik River drainages and various streams in Yukon Territory, Canada, including the mainstem Yukon River. Fall chum salmon run sizes are typically much smaller than summer chum salmon.

Coho salmon enter the Yukon River from early August through September. Coho salmon weigh an average of about 7 pounds. Coho salmon spawn discontinuously throughout the Alaska portion of the Yukon drainage, primarily in tributaries in the lower 700 miles and in the Tanana River drainage. Major spawning populations of coho salmon have been documented in tributaries of the Tanana and Andreafsky Rivers.

Pink salmon enter the lower river from late June to late July. Commercially caught pink salmon weigh an average of 2 to 3 pounds. They primarily spawn in the lower portion of the drainage, downstream of the community of Grayling (river mile 336). However, pink salmon have been caught in the mainstem Yukon River upstream as far upriver as Fort Yukon, located at river mile 1,002 (Busher et al. 2009). In the past decade, pink salmon have exhibited a 2-year abundance cycle with high abundance typically on even-numbered years. Sockeye salmon are uncommon in the Yukon River drainage, and only a few fish are caught each year but have been reported as far upstream as Rampart (river mile 763). Observations of sockeye salmon have occurred in the Innoko River (ADF&G 1986), Kanishka River (Louis Barton, Fishery Biologist, ADF&G, Fairbanks; personal communication, telephone, February 17, 2020), Tanana River upstream of the confluence with Kantishna River (Padilla et al. *In prep*), Anvik River (Brodersen 2019), and Gisasa River (Carlson 2017) drainages. Sockeye salmon are annually counted at the Andreafsky River weir (Conitz 2019).

FISHERIES OVERVIEW

Of the 5 species of Pacific salmon found in the Yukon management area, Chinook, chum, and coho salmon are predominantly harvested in the subsistence, commercial, personal use, and sport fisheries. Lamprey and whitefish are harvested for subsistence and occasionally for commercial uses. Other marine and freshwater finfish are primarily harvested for subsistence use (Appendix B1).

Chinook salmon is the most targeted subsistence species by number of participants. Subsistence stakeholders target Chinook salmon throughout the Yukon River drainage and coastal waters. Prior to 1998 and in years with adequate Chinook salmon run sizes, intensive management of subsistence fisheries was not necessary. In 1998, Chinook salmon productivity began declining, and run sizes were considerably weaker than historical runs; the most dramatic drop in run sizes began in 2007 (Figure 3). Since 2008, Chinook salmon fishing restrictions, in addition to those imposed by the regulatory subsistence fishing schedule (Appendix C1), have been necessary for most years to meet escapement goals. Beginning in 2012, intensive subsistence fishery management included full fishing closures around pulses of fish, fishing time reductions, gear restrictions, and full fishing closures for Chinook salmon most of the summer season. Chinook salmon run size began to rebound in 2016, and restrictions were relaxed. By 2019, subsistence harvests reached 48,379, the highest harvest since 2007. However, returns have declined since then, and severe harvest restrictions in 2021 led to the lowest subsistence harvest (1,995 fish) on record (Appendix C2).

Summer chum salmon provide the largest subsistence harvest of salmon in the Yukon management area (including the Coastal District), averaging about 87,000 fish harvested annually since 2011 (Appendix C3). Subsistence stakeholders mainly target summer chum salmon in the lower Yukon River. Although summer chum salmon are found as far upstream as the lower portion of Districts 5 and 6, upriver stakeholders typically do not target them due to their poor quality. Harvest levels have been affected by subsistence fishing restrictions due to their overlap in run timing with Chinook salmon. During periods of low Chinook salmon run abundance, beach seines, dip nets, and fish-friendly fish wheels were required to allow the live release of Chinook salmon. Annual subsistence harvests of summer chum salmon (including those from the Coastal District) averaged about 71,000 fish from 2016 to 2020, but harvest restrictions were implemented in 2021 due to

exceptionally low chum salmon returns, and only 1,266 fish were harvested for subsistence (Appendix C3).

Fall chum salmon provide the second largest subsistence harvest, and an average of about 78,000 (including the Coastal District) fish were harvested annually from 2011 to 2020 (Appendix C4). Subsistence stakeholders target fall chum salmon throughout the Yukon River drainage, with most of the harvest occurring in the upper Yukon River and Tanana River late in the season. Harvest generally coincides with freezing weather, which allows some dog mushers to “crib” fish for use as dog food (Andersen and Scott 2010). Subsistence fishing harvest levels increased in the mid-2010s due to low runs of Chinook salmon but have since decreased because of the decline in the use of dog teams. In 2020 and 2021, the fall chum salmon subsistence harvests were minimal, coinciding with extremely poor salmon returns (Appendix C4).

Coho salmon harvests generally occur incidentally while targeting fall chum salmon. The subsistence harvest averaged about 15,000 fish annually from 2011 to 2020 (Appendix C5). Much of the coho salmon harvest occurs in Districts 5 and 6, late in the season. Some dog mushers also “crib” coho salmon once freezing weather allows (Andersen and Scott 2010). The subsistence harvest in 2021 was record low due to the severe salmon fishing closures surrounding fall chum salmon.

Pink salmon are primarily harvested for subsistence in the lower river districts. The 2-year abundance cycle of pink salmon is reflected in their subsistence harvests. The subsistence harvests during odd-years for the entire drainage from 2001 to 2019 averaged 2,366 pink salmon. The even-year subsistence harvests from 2002 to 2020 averaged 6,913 pink salmon (Appendix C6).

Commercial Chinook salmon harvests in the Alaska portion of the Yukon River drainage between 2000 and 2007 peaked at 56,151 fish in 2004 (Appendix C2). However, because of poor Chinook salmon runs, no Chinook salmon-directed commercial fishing has occurred in the Yukon management area since 2007. Since 2010, the sale of incidentally caught Chinook salmon in the chum salmon-directed commercial fisheries has not been allowed, with 1 exception; in 2019, the incidental sale of Chinook salmon during the tail end of the run was allowed in the lower Yukon chum salmon fisheries, and a small number of Chinook salmon were sold (2,582 fish; Appendix D9).

Commercial harvests of summer chum salmon fluctuated from 2001 through 2020. After a closure due to low returns in 2001, limited market interest and low run sizes caused summer chum salmon harvests to be relatively low for 5 years, with harvests between roughly 11,000 fish in 2003 to 92,000 fish in 2006 (Appendix C3). Over time, the summer chum salmon stock rebounded, and harvests reached some of the largest since 1996. Selective gear was introduced in 2012 that allows commercial fishing for summer chum salmon while releasing Chinook salmon alive. Summer chum salmon commercial harvests reached a 20-year high of about 577,000 fish in 2018 (Appendix C3). There is occasional commercial exploitation of summer chum salmon roe in Subdistrict 4-A; however, the redevelopment of this fishery has been hindered by inconsistent market interest and low numbers of co-migrating Chinook salmon that necessitate conservative management strategies. In 2020, a low summer chum salmon return led to closures during most of the season, reducing harvest to its lowest point since 2003. In 2021, the summer chum salmon run was again low (Figure 4); therefore, the commercial fishery was closed for the entire season (Appendix C3).

Similarly, fall chum salmon experienced decreased market interest and low fall chum salmon returns from 1998 to 2004. A considerable amount of uncertainty has been associated with run forecasts, particularly in the last decade, because of unexpected run failures (1998–2002) followed by strong runs from 2003 through 2008. Beginning in 2008, markets began to improve, but run sizes lacked consistency. By 2011, the fall chum salmon run stabilized, and commercial harvests of fall chum salmon from 2011 through 2020 averaged roughly 301,000 fish (Appendix C4). However, no commercial fishing for fall chum salmon occurred in 2020 and 2021 due to the extremely poor runs.

Although summer and fall chum salmon are targeted in commercial fisheries, coho salmon are typically incidentally harvested during fall chum salmon-directed fisheries. The commercial harvest of coho salmon since 2011 has averaged about 107,000 fish (Appendix C5). Since 2009, ADF&G has had the flexibility to conduct late-season coho salmon-directed commercial fishing if specific stipulations are met; such fisheries occurred in 2009–2011 and 2014–2018. Record coho salmon harvests occurred in 2014 and 2015. The largest commercial harvest on record was in 2016. Since 2016, the commercial harvest of coho salmon has averaged 127,000 fish (Appendix C5). No commercial fishing occurred for coho salmon in 2020 and 2021 due to the poor run sizes.

MANAGEMENT

The policy of ADF&G is to manage salmon runs to the extent possible for maximum sustainable yield unless otherwise directed by Alaska regulation (*Policy for the Management of Sustainable Salmon Fisheries* [SSFP; 5 AAC 39.222]). Over the past few decades, ADF&G has managed salmon fisheries in the Yukon management area with the dual goal of achieving desired escapements consistent with the SSFP while at the same time maintaining important fisheries. The Alaska State Legislature and the Alaska Board of Fisheries (BOF) have designated subsistence use as the highest priority among beneficial uses of the resource. Conservative management of the Yukon River is required to maintain subsistence priority, provide an opportunity for spawning escapements, and ensure sustainable yields.

For management purposes, the summer season refers to the fishing associated with the Chinook and summer chum salmon migrations, and fall season refers to the fishing associated with the fall chum and coho salmon migrations. Salmon fisheries within the Yukon River drainage may harvest stocks several weeks and over a thousand miles from their spawning grounds. Because the Yukon River subsistence and commercial fisheries are mixed stock fisheries, some tributary populations may be under or overexploited relative to their actual abundance. Based on current knowledge, it is not possible to manage individual stocks in most areas where fishing occurs. Fisheries within the Tanana and Anvik River drainages are managed as terminal areas.

Management of the Yukon River salmon fishery is complex due to overlapping multispecies salmon runs, increasing efficiency of the fishing fleet, allocation issues, and the immense geographic expanse of the Yukon River drainage. ADF&G uses an adaptive management strategy that evaluates run strength inseason to determine a harvestable surplus above escapement requirements and subsistence uses. The primary tools used by ADF&G to manage the salmon fisheries are management plans, guideline harvest ranges established by the BOF, and emergency order (EO) authority, which is used to implement time and area openings/closures, and gear restrictions. Guideline harvest ranges have been established for Chinook, summer chum, and fall chum salmon commercial fisheries throughout the Alaska portion of the drainage (Appendix D1). ADF&G attempts to manage the commercial salmon fishery harvest in each district or subdistrict

proportional to the respective guideline harvest ranges. Typically, most of the coho salmon harvest is incidental to the fall chum salmon fishery, and their management is conditional on the abundance of fall chum salmon. ADF&G does have the option to conduct late-season coho salmon-directed commercial fishing if specific stipulations are met. Likewise, most pink salmon commercially harvested is incidental to the summer and fall chum salmon-directed commercial fisheries. However, beginning in 2016, ADF&G was given the option to allow a pink salmon-directed commercial fishery in June and July.

During the fishing season, management is based on preseason projections and inseason run assessment. Inseason run assessment includes abundance indices from test fisheries, passage estimates from various sonar projects, and spawning escapement and harvest data. Since 1995, the mainstem sonar project at a camp near the Pilot Station community (hereafter called Pilot Station sonar) has provided inseason estimates of salmon passage for fisheries management (Dreese and Lozori 2019). The level of subsistence, commercial, sport, and personal use harvests can be adjusted through EOs to control time and area of openings and closures, to restrict fishing gear, or any combination. Advisory Announcements are broadcasted on local radio stations, posted on the ADF&G website,¹ VHF radio if available, transmitted by fax, and emailed to members of an open list serve that includes communities, processors, buyers, and others. Most processors and buyers are notified of EOs by telephone.

In 2021, various government and nongovernmental agencies operated projects in the Alaska and Canada portions of the Yukon River drainage to obtain the biological information necessary for the management of salmon runs (Appendices A1 and A2). In 2021, some projects did not operate or were operated at a reduced capacity due to the COVID-19 pandemic. The types of monitoring projects operating in the Alaska portion of the drainage include:

1. *Catch and effort assessment:* The harvest and effort of commercial, subsistence, personal use, and sport salmon fisheries were assessed for the Alaska portion of the Yukon River drainage. Commercial salmon fishing is typically monitored from June through October using fish tickets of commercial sales of salmon. However, in 2021, the runs of all salmon species were poor; therefore, commercial fishing remained closed all season. In the majority of the Yukon management area, there is no regulatory requirement for stakeholders to report their subsistence salmon harvest. The subsistence salmon harvest from communities is estimated through a voluntary household survey program. In areas of the drainage with road access, stakeholders must obtain subsistence or personal use household permits on which their daily harvest is recorded. Similarly, sport fishing harvest and effort were estimated by the Division of Sport Fish using mail-out questionnaires to sport fishing permit holders. Weekly teleconferences were held from June through August by the Yukon River Drainage Fisheries Association (YRDFA) as a forum for stakeholders along the Yukon River to interact with ADF&G and federal managers and for the dissemination of fisheries information.
2. *Test fishery:* A test fishery project was operated in the lower Yukon River at the South and Middle (Middle and North combined) mouths. The project utilized set gillnets from late May through July 15 to index the Chinook salmon run relative abundance, drift

¹ Fishing Releases, Notices, and News: Commercial, Subsistence, and Personal Use, <http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main> (Accessed May 27, 2022).

- gillnets from late May through July 15 to provide an index of Chinook and summer chum salmon run abundance, and from July 16 through September 10 for fall chum and coho salmon runs. The test fisheries also provided run timing and age composition information. A test fishery in Mountain Village was operated by the Asa'carsarmiut Traditional Council to index fall chum and coho salmon run timing and relative abundance using drift gillnets.
3. *Mainstem sonar projects:* Hydroacoustic equipment was operated in the mainstem Yukon River at 2 locations: near Pilot Station to obtain inseason salmon passage estimates by species and near Eagle to estimate the passage of Chinook and fall chum salmon into Canada. These projects include associated test gillnet fisheries for species apportionment applied to the sonar counts.
 4. *Tributary sonar projects:* Hydroacoustic equipment was operated in the Anvik River to estimate summer chum salmon escapement and in the Teedriinjik River to estimate fall chum salmon spawning escapements. Sonar operations also occurred in the Tanana River drainage on the Chena and Salcha Rivers to estimate Chinook and summer chum salmon escapement.
 5. *Age, sex, and size composition:* Data were collected from salmon harvested in subsistence fisheries, as well as test fisheries and escapement projects located throughout the Yukon River drainage. Samples were collected using gillnets, weir traps, and carcass surveys. Scales were collected from salmon to determine the age composition of the runs. Chum salmon escapement sampling from carcasses uses vertebrae for aging instead of scales because of resorption problems. The length was measured from mid eye to fork of tail. Sex was determined by examining internal reproductive organs or external characteristics. In 2018, ADF&G implemented a regional effort to evaluate the accuracy of external sex identification methods used at key assessment projects; this effort was continued at select locations in 2021. Chinook, chum, and coho salmon were sampled for external sex identification at the Lower Yukon River test fishery (LYTF), and only Chinook salmon were evaluated at Eagle sonar.
 6. *Genetic stock identification:* Genetic samples were collected from Chinook and chum salmon caught in select test fisheries throughout the drainage. Analysis of Chinook and chum salmon were conducted to identify relative proportions of various stocks for inseason management purposes.
 7. *Aerial and ground surveys of salmon spawning streams:* Aerial surveys are typically flown to monitor spawning escapement in major spawning tributaries throughout the Yukon River drainage. Surveys for Chinook and summer chum salmon were unable to be flown in late July due to adverse weather conditions. Fall chum salmon foot surveys were conducted at selected areas in the Tanana River drainage from October through early December. Aerial surveys were conducted in the Toklat (springs area), Nenana, and upper Tanana River drainages to estimate fall chum and coho salmon escapement in November.
 8. *Tower projects:* Tower counting projects were used on the Chena and Salcha Rivers to estimate the escapement of Chinook and summer chum salmon from July through August, and provided partial estimates due to run timing. The Chena and Salcha projects were supplemented with sonar operations to determine passage estimates during high water events.

9. *Weir projects*: The East Fork Andreafsky River weir operated from mid-June to late August to estimate Chinook and summer chum salmon escapement. Henshaw River weir operated from late June to late July but was discontinued early due to a high water event. Gisasa River weir was not operated in 2021.
10. *Smolt studies*: Yukon Delta smolt project (National Marine Fisheries Service [NMFS], Spearfish Research, and Yukon Drainage Fisheries Development Association): This project has been ongoing since 2014, and new objectives were introduced in 2016. Net-sampling methods were utilized in Yukon River tributaries and pro-delta habitats to catch juvenile salmon and other finfish species. The goals of this project are to determine the composition and spatiotemporal variation in prey species of juvenile Chinook salmon; determine the quality of dominant juvenile Chinook salmon prey; assess the relationship between prey quality and juvenile Chinook salmon size and condition during summer; evaluate juvenile Chinook salmon spatial distribution and habitat use in relation to prey communities in Yukon River tributaries and delta habitats; and evaluate spatiotemporal differences in juvenile Chinook salmon condition, size, and energy content.
11. *Juvenile research*: Northern Bering Sea (NBS) surface trawl survey (National Oceanic and Atmospheric Administration [NOAA] and ADF&G): NBS pelagic trawl surveys were initiated by NOAA–Alaska Fisheries Science Center (AFSC) in 2002 as part of the Bering Aleutian Salmon International Survey (BASIS). Surveys continued through 2007 and 2009–2019, and 2021 under various funding sources. The NBS is the primary rearing habitat of Yukon River-origin juvenile Chinook salmon during their first summer at sea. The NBS surveys have occurred primarily in September, assessing juvenile salmon after they experience a critical transition from freshwater to marine environments. The survey utilizes surface trawl fishing gear to capture juvenile salmon at stations spaced 30 nmi between 60°N and 65.5°N and from Norton Sound west to 171°W. The primary objective of this research is to estimate stock-specific juvenile Chinook salmon abundance and provide adult run size forecasts for Canada-origin and drainagewide Yukon River Chinook salmon (Figure 5). An additional objective of the survey is to collect data to inform the understanding of the early marine ecology of juvenile salmon, such as diet, growth, and energetic density.

The Pilot Station sonar is the primary project used to determine the abundance of fish passage per the fishery management plans inseason. Updated selectivity parameters for all species were developed after the 2015 season and are used for producing passage estimates inseason at the project (Pfisterer et al. 2017). The daily passage estimates, by species, since 1995 have been updated with these improved selectivity parameters and can be obtained from the ADF&G, Division of Commercial Fisheries, Arctic-Yukon-Kuskokwim (AYK) database management system (AYKDBMS).²

The Yukon River Chinook salmon run is managed according to the guidelines described in the *Yukon River King Salmon Management Plan* (5 AAC 05.360). The management plan provides escapement needs and subsistence uses while aiming to reestablish other users' historical range of harvest levels. In response to guidelines established in the SSFP (5 AAC 39.222(f)(42)), the BOF

² Arctic-Yukon-Kuskokwim Database Management System (AYKDBMS). 2006–. Alaska Department of Fish and Game, Division of Commercial Fisheries. Juneau, AK. https://www.adfg.alaska.gov/CF_R3/external/sites/aykdbms_website/Default.aspx (accessed May 27, 2022). Hereafter cited as AYKDBMS.

classified Yukon River Chinook salmon as a stock of yield concern at its September 2000 work session. A stock of yield concern is defined as “a concern arising from a chronic inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock’s escapement needs; a stock of yield concern is less severe than a management concern” (5 AAC 39.222(f)(42)). The SSFP defines chronic inability as “the continuing or anticipated inability to meet expected yields over a 4 to 5-year period.” This determination as a stock of yield concern was initially based on low harvest levels from 1998–2000 and anticipated low harvest in 2001. The BOF continued the classification as a stock of yield concern in 2004, 2007, 2010, 2013, 2016, and 2019 (Carroll et al. 2018).

The Yukon River summer chum salmon run is managed according to the guidelines described in the *Yukon River Summer Chum Salmon Management Plan* (5 AAC 05.362). This plan intends to conservatively manage harvests to provide for escapement needs and subsistence use as a priority over other consumptive uses such as commercial, sport, and personal use fishing. Since 2001, this management plan has allowed for varying levels of harvest opportunity depending on the run size projection. The BOF modified the management plan in 2016. Directed summer chum salmon commercial opportunity was provided from 2007 to 2018. Unfortunately, despite large run sizes from 2007 to 2018, full exploitation of harvestable surplus has been hindered by limited buyer capacity and conservative management strategies in response to poor Chinook salmon runs that co-migrate with summer chum salmon.

The *Anvik River Chum Salmon Fishery Management Plan* (5 AAC 05.368) allows the Anvik River to be opened to summer chum salmon commercial fishing if a surplus beyond the escapement goal of 500,000 fish is available. All Chinook salmon taken in the Anvik River during commercial fishing must be returned to the water alive. Summer chum salmon were harvested in this terminal area only from 1994 to 1997.

Management of the Yukon management area fall season commercial salmon fisheries follows the *Yukon River Drainage Fall Chum Salmon Management Plan* (5 ACC 01.249). The plan sets the threshold number of fall chum salmon needed to prosecute a commercial fishery at 550,000 fish, and commercial fishing is allowed on the surplus above that level. The fall chum salmon plan incorporates the amount of fall chum salmon needed to meet U.S./Canada treaty objectives for border passage and provides guidelines necessary for escapement and prioritized uses. The plan aligns management objectives with the established escapement goals, provides flexibility in managing subsistence harvests when stocks are low, and bolsters salmon escapement as run abundance increases.

Coho salmon are primarily harvested incidentally during the fall chum salmon-directed commercial fishery. The *Yukon River Coho Salmon Management Plan* 5 ACC 05.369 allows a coho salmon-directed commercial fishery in the absence of achieving the threshold number of fall chum salmon if a harvestable surplus of coho salmon exists and if a commercial fishery will not have a significant effect on fall chum salmon escapement and allocation.

Finally, under the *Tanana River Salmon Management Plan* 5 AAC 05.367, commercial fishing in Subdistrict 5-A and District 6 is based on the assessment and timing of salmon stocks bound for the Tanana River drainage.

Since 2001, the subsistence fishery has been based on a schedule implemented chronologically by ADF&G, and consistent with migratory timing as the Chinook salmon run progresses upstream (Appendix C1). Beginning with ice out, subsistence fishing is open 7 days per week until the

schedule is established by EO. The objectives of the schedule are to (1) reduce harvest early in the run when there is a higher level of uncertainty in run assessment, (2) spread the harvest throughout the run to reduce harvest effects on any single component of the run, and (3) provide subsistence fishing opportunity among all user groups during years of low salmon runs.

FEDERAL SUBSISTENCE MANAGEMENT

The Alaska National Interest Lands Conservation Act (ANILCA) of 1980 mandates that rural subsistence users have priority over other users to take wildlife on federal public lands where recognized customary and traditional use patterns exist, and requires the creation of Regional Advisory Councils (RAC) to enable rural residents to have a meaningful role in federal subsistence management. On October 1, 1999, the Secretary of Interior and Secretary of Agriculture published regulations to expand federal management of subsistence fisheries to Alaska rivers, lakes, and limited marine waters within and adjacent to federal public lands. The Secretaries delegated their authority in Alaska to the Federal Subsistence Board (FSB) to manage fish and wildlife resources for subsistence uses on federal public land, including waters running through or next to these lands. Federal subsistence fishing regulations are adopted by the FSB. The RACs provide recommendations and information to the FSB, review policies and management plans, provide a public forum, and deal with other matters relating to subsistence uses. The FSB or U.S. Fish and Wildlife Service (USFWS) may close fishing for other uses in these waters and implement a priority for federally qualified rural subsistence users if it is determined that ADF&G-managed fishery management is causing subsistence or conservation concerns (Ward and Horn 2003). Federal subsistence fishing schedules, openings, closures, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05.060), unless superseded by a Federal Special Action (United States, Department of Interior, Fish and Wildlife Service, 835).

Federal Subsistence Management Actions

Federal management staff works closely with ADF&G Division of Commercial Fisheries managers of the Yukon management area, sharing information and coordinating management actions. Many public fisheries-related meetings are attended throughout the year by both agencies jointly and individually that are preceded with considerable effort to provide consistent stock information, management strategy expectations, and rationale for management actions. ADF&G area managers are the lead agency staff with authority throughout the entire Yukon management area. Federal management authority is limited to federal public waters within or adjacent to federal wildlife refuges, national parks, and federal conservation areas. During the 2021 fishing season, federal managers issued several Streamlining Actions which aligned federal subsistence fishing regulations with State of Alaska regulations established through ADF&G's EO authority. In the Yukon management area in 2021, there were no commercial fisheries for salmon conducted by ADF&G. No Federal Special Actions were issued during the 2021 season which would be used to implement changes in federal rules that differ from Alaska regulations (Holly Carroll, Fisheries Biologist, USFWS, Fairbanks; personal communication, email, June 2, 2022).

CANADA YUKON RIVER SALMON FISHERY

The Canada portion of the Yukon River drainage maintains Aboriginal, domestic, commercial, and public angling fisheries for salmon. The Aboriginal and domestic fisheries are comparable to subsistence and personal use fisheries in Alaska, although the Aboriginal fishery is only open to

First Nations. All the commercial salmon harvests in Canada occur on the mainstem Yukon River. Canada salmon harvests in the Porcupine River drainage consist only of an Aboriginal fishery.

Records indicate that a Canadian commercial fishery occurred sporadically from 1903 to 1917 and continuously from 1918 to 1947. No harvest records are available from 1948 to 1957. Harvest records document the annual salmon harvest by species since 1958 and by user group since 1961. DFO has provided annual harvest data from the Canada portion of the Yukon River drainage since 1962.

U.S./Canada Yukon River Salmon Treaty and Panel

The U.S. and Canada initiated negotiations in 1985 regarding a Yukon River salmon treaty that would enhance the management coordination of salmon stocks spawning in the Canada portion of the Yukon River drainage. Achieving a comprehensive long term agreement posed a formidable challenge through the mid-1990s. In February 1995, an agreement was formalized, resulting in an interim *Yukon River Salmon Agreement* (YRSA). A Yukon River Panel (Panel), made up of delegates from the U.S. and Canada, was formed to implement the YRSA. The Panel's focus was on the salmon stocks that spawn in the Canadian portion of the Yukon River drainage.

In December 2002, the United States and Canada signed a formal YRSA that set harvest share target ranges based on a postseason run assessment for Chinook and fall chum salmon into the Canada mainstem of the Yukon River. Under the YRSA, the Alaska and Canada fisheries are managed consistent with conservation objectives that were jointly developed. The Panel meets semiannually and advises the United States and Canada governments on the conservation and management of salmon originating in the Canada portion of the Yukon River. In recognition of the changing dynamics of the fishery and the spirit of the agreement, interim management objectives are jointly reviewed and agreed upon each spring before the salmon returns. In addition to escapement needs, Alaska is obligated to share harvestable surpluses of the Canadian-run component, and Canada received 20% to 26% of the available total allowable catch (TAC) for Canadian-bound Chinook salmon and 29% to 35% of the available TAC for Canadian-bound fall chum salmon.

Canada Chinook Salmon

In 2010, the Panel adopted an interim management escapement goal (IMEG) range of 42,500–55,000 Chinook salmon. In the absence of a biological escapement goal, a goal based on a production or population model, the IMEG has been retained each year since. The JTC undertook a comprehensive multiyear review of the current IMEG and presented the Panel with recommendations during the spring 2022 Panel meeting. Discussions on an escapement goal for future seasons are still ongoing, but in the interim, the JTC recommended that the current IMEG range of 42,500–55,000 be used for the 2020 and 2021 seasons (JTC 2022). The success of achieving this escapement goal is assessed using the mainstem sonar operated near Eagle, Alaska (hereafter referred to as Eagle sonar), passage estimate minus catches from fisheries occurring upstream of the sonar, namely U.S. subsistence catch near the community of Eagle, Alaska, and the harvest from Canada fisheries.

Canada Fall Chum Salmon

The upper Yukon River escapement goal specified within the YRSA is greater than 80,000 fall chum salmon. This goal was achieved 15 times from 1982–2009 (28 years) and met 25 times through 2021. The DFO fall chum salmon mark-recapture program was conducted from 1982 to

2008, and the joint U.S./Canada sonar program operated near Eagle, Alaska, was conducted for fall chum salmon since 2006. The mark–recapture estimates generally agreed with mainstem Yukon River sonar estimates for fall chum salmon when the 2 programs were conducted concurrently (2006–2008). Therefore, the sonar project on the mainstem Yukon River became the primary assessment tool for the Canada border passage and has been applied since 2006.

The upper Yukon River escapement goal was reviewed in 2001. After considerable analysis of the available data, a recommendation was made for a biological escapement goal (BEG) of 60,000 to 129,000 fall chum salmon (Eggers 2001). However, due to concerns about the quality of the data and analytical issues, the BEG recommendation was not accepted during a Pacific Scientific Advice Review Committee (PSARC) review (Tanasichuk 2002).

In 2021, the JTC recommended that the Canada-origin mainstem Yukon River IMEG remain as established in 2010 as a range from 70,000 to 104,000 fall chum salmon. This range was developed as 0.8 to 1.2 times the estimated spawners at maximum sustained yield (86,600 fish), which was derived before the returns from the exceptional 2005 spawning escapement of over 437,000 fall chum salmon. Run size at the border has been assessed through the joint U.S./Canada sonar program near Eagle since 2006.

Fishing Branch River Fall Chum Salmon

The escapement goal specified within the YRSA ranges from 50,000 to 120,000 fall chum salmon to the Fishing Branch River. This goal has been achieved only 10 times from 1974 to 2012 and only 5 times from 1985 to 2021 when the full-season weir operation was the primary assessment project. The Fishing Branch River escapement goal was reviewed in 2001, and after a thorough analysis of the available data, a recommendation was made for a BEG of 27,000 to 56,000 fall chum salmon (Eggers 2001). However, because of concerns about the quality of the data and analytical issues, the BEG recommendation was also not accepted during a PSARC review (Tanasichuk 2002).

In April 2008, the Panel accepted the JTC recommendation to adopt an IMEG range of 22,000 to 49,000 fall chum salmon for the Fishing Branch River for the 2008 to 2010 period. The percentile method (Clark et al. 2014) was used to determine the IMEG. The analysis used escapement contrast, the ratio of maximum to minimum escapement, and harvest rate information to determine the percentile range of observed escapements appropriate for the escapement goal range determination. In the Fishing Branch River fall chum salmon analysis, escapements from 1985 to 2007 (excluding 1990) were incorporated along with the high contrast ratio of 24:1. The escapement goal range reflects the 25th and 75th percentiles of 22 years of Fishing Branch River weir counts (Clark et al. 2014).

The use of this IMEG range has continued because no new data for analysis has become available. In 2013–2014, attempts were made to assess the Fishing Branch River escapement based on a combination of projects operated near the community of Old Crow, including sonar estimates of fall chum salmon and the proportion of Porcupine River chum salmon radiotag recoveries upstream of the weir site. However, because there are concerns about the tagging portion of this study, comparing it to the weir goal is not substantiated. The Fishing Branch River weir operated concurrently with the Porcupine River border sonar in 2015–2017, 2019, and 2021. In 2018, high water did not allow for a fall chum salmon estimate from the Porcupine River sonar project, and in 2020 the project was not operated due to the COVID-19 pandemic. Since 2016, the Fishing Branch River weir counts have been supplemented by the sonar estimates, which help during high

water events, and video monitoring has been incorporated to reduce impediments to migration. The Fishing Branch River weir operated in 2021 (since the project is isolated) and resulted in an estimated escapement of 2,413 fall chum salmon, the lowest estimate since 1974, and was well below the IMEG (22,000–49,000 fish; Appendix B2).

For 2021, the Panel adopted the JTC recommendation that the Fishing Branch IMEG remain as established in 2008 as a range of 22,000–49,000 fall chum salmon for the 2020–2022 seasons (JTC 2022). This range has been extended for 3-year periods since 2008 to match the ADF&G escapement review cycles.

2021 SALMON OUTLOOK

Before each season, the salmon run sizes are forecasted using various methods, and a preseason outlook is created for each species. Preseason outlooks are shared with the public, and a generalized management strategy flier is mailed to all known fishing households in the Yukon management area. Preseason outlooks guide the early management actions before salmon runs enter the river because inseason assessment data are collected, and management strategies are adapted inseason.

Chinook Salmon Juvenile-Based Forecast

Pelagic trawl surveys in the NBS capture Yukon River Chinook salmon in September after they have spent their first summer at sea (juvenile life-history stage). Since 2003, juvenile Chinook salmon catch from the trawl surveys and genetic stock composition estimates have been used to provide stock-specific juvenile abundance estimates (Murphy et al. 2017, 2021; Howard et al. 2020; JTC 2022). Juvenile Chinook salmon experience relatively stable marine survival after their first summer in the NBS. As a result of this stable marine survival, the relationship between juvenile Chinook salmon abundance in the NBS positively correlates to adult returns to the Yukon River. This relationship is pivotal to the juvenile-based forecast model used to predict adult returns up to 3 years in advance. These models produce forecasted run sizes for drainagewide Chinook salmon (Figure 5a) and the Canada-origin returns (Figure 5b). Forecasts are not used directly to manage fisheries but inform the Chinook salmon outlook and share expected trends in the coming seasons with the public. Early indications suggest that Chinook salmon runs to the Yukon River will decrease in 2021 and 2022 (Figure 5). No surveys occurred in the NBS in 2020 due to the COVID-19 pandemic, preventing the ability to produce a 2023 juvenile forecast.

Chinook Salmon Outlook

The 2021 outlook for drainagewide Yukon River Chinook salmon run was estimated by applying historical average proportions of Canada-origin fish in the total run to the JTC-approved Canada-origin run outlook. This was based on a combination of sibling and spawner–recruit forecast models and also incorporated information from marine juvenile abundance forecast methods (JTC 2022). The 2005–2020 weighted average proportion of Canada-origin fish (measured at Pilot Station sonar) was 41%. Therefore, for 2021, the Canada-origin outlook of (42,000–77,000) was divided by 41% (JTC 2022). This created a drainagewide outlook of 102,000–189,000 fish. A run of this size is similar to 2012 and 2013; despite restricted fishing in those years, the Canada Chinook salmon escapement objective was not met.

Summer Chum Salmon

The strength of the summer chum salmon run in 2021 was dependent on production from the 2017 (age-4 fish) and 2016 (age-5 fish) escapements because these age classes generally dominate the run. The drainagewide spawning escapement in 2016 was an estimated 1.9 million chum salmon and in 2017 was an estimated 3.0 million summer chum salmon. The escapement goal on the Anvik River (350,000–700,000 fish) was achieved in 2017 but not in 2016, and the escapement goal on the East Fork Andreafsky River (>40,000 fish) was met in 2016 and 2017. It was expected that the 2021 projected run of approximately 1.2 million fish would be larger than the 2020 run of approximately 780,000 fish based on the forecasts created by ADF&G Division of Commercial Fisheries Biologist, Fred West, and published in the outlook flier mentioned previously. The 2021 summer chum salmon run was anticipated to provide for escapements, a normal subsistence harvest, and a surplus of 0.5 million for commercial harvest. Summer chum salmon runs provided a harvestable surplus each year from 2003 to 2020.

Fall Chum Salmon

The 2021 run was made up of fish returning from the parent years 2015–2018. Estimates of returns per spawner (R/S), based on brood year return, were used to estimate production for 2015 and 2016. A Ricker spawner–recruit model was used to predict returns from 2017 and 2018. The point projection in 2021 used the 1974–2014 complete brood year returns applied odd/even maturity schedule for the same time. The result was a point estimate of 652,000 fall chum salmon. The 2021 run size forecast was expressed as a range of 542,000–762,000 fall chum salmon. The forecasted run size was below average for an odd-numbered year run (Appendix B17).

The contributing parent-year escapements from 2016, 2017, and 2018 exceeded the upper end of the drainagewide escapement goal range of 300,000–600,000 fall chum salmon, and escapement in 2015 was within the goal range (Appendix B17). The major contributor to the 2021 fall chum salmon run was expected to be age-0.3 fish returning from the 2017 parent year, and the age-0.4 was also anticipated to set a record low (Appendix B17).

Coho Salmon

Although there is little comprehensive escapement information for Yukon River drainage coho salmon, it is known that coho salmon primarily return as age-2.1 fish (age in European notation and also known as 4-year-old or age-4) and overlap in run timing with fall chum salmon. The major contributor to the 2021 coho salmon run was the age-4 fish returning from the 2017 parent year. Based on the run size index, the 2017 escapement was estimated to be 167,000 coho salmon, near the long-term average of 163,000 fish (1995–2020, excluding 1996 and 2009; Appendix B21).

Escapements are mostly monitored in the Tanana River drainage. The Delta Clearwater River (DCR) is a major producer of coho salmon in the upper Tanana River drainage and has had comparative escapement monitoring data since 1972. The parent-year escapement in the DCR of 9,617 fish in 2017 (Appendix B20) was within the sustainable escapement goal (SEG) range of 5,200–17,000 coho salmon. An additional 4 locations in the Tanana River drainage were surveyed for coho salmon specifically; three-quarters were above-average compared to the 2016–2020 average (Appendix B20). The coho salmon run outlook is based on parent year escapements assuming average survival, and the run was expected to be near average.

2021 SALMON MANAGEMENT AND HARVESTS

Yukon Drainage Salmon Harvests

The total 2021 harvest of the Alaska portion of the Yukon River drainage, including the Coastal District, was 1,995 Chinook salmon, 1,266 summer chum, 0 fall chum, 296 coho, and 2,650 pink salmon (Table 1, Appendices C2–C6).

Alaska Commercial Fishery

There was no commercial fishing for any salmon species in the Alaska portion of the Yukon management area in 2021. One salmon processor, Kwik’pak Fisheries LLC (2909 Arctic Blvd, Anchorage, AK 99503), registered, but no products were produced due to the commercial fisheries closures. Closures of the directed Chinook salmon fishery have been the norm since 2011 (Appendix C2; JTC 2022: Appendix B2). However, 2021 represented the second time that summer chum salmon commercial fisheries were closed for the entire season; the other full closure was in 2001 (Appendix C3; JTC 2022: Appendix B3). Fall chum and coho salmon commercial fisheries also had only 1 other full closure, which occurred in 2020 (Table 1, Appendices C4 and C5).

Chinook and Summer Chum Salmon Assessment

The LYTF program is designed to assess salmon run timing and relative abundance and typically consists of 2 Chinook salmon test fisheries; an 8.5-inch mesh set gillnet test fishery operated in the South and Middle mouths of the Yukon River, and an 8.25-inch mesh drift gillnet operated at Big Eddy in the South Mouth near Emmonak. The LYTF also has a summer chum salmon-directed drift gillnet test fishery using 5.5-inch mesh gear operated in the South and Middle mouths. These test fisheries provide catch per unit effort (CPUE), which gives an index of abundance and indicates the presence of large groups of fish, or pulses, entering the mouths of the river.

The LYTF operated at normal effort at the South Mouth (Big Eddy) drift and set gillnet sites starting on May 22 and June 3, respectively. The Middle Mouth Chinook salmon set gillnet site did not operate for the 2021 summer season because of restrictions due to COVID-19 and the logistical complications of operating a field camp. However, an additional 8.25-inch mesh drift gillnet was fished in the Middle Mouth, allowing the crew to effectively commute to and from Emmonak while still providing test fishery indices of the run from that mouth of the river. Furthermore, using a drift gillnet reduced the incidental mortality of Chinook salmon in a low abundance year and streamlined fish donations for a logistically challenging location. The 5.5-inch drift net operations for summer chum salmon also returned to the Middle Mouth following a 1-year suspension.

Ice breakup at the mouth of the Yukon River occurred on May 13, 6 days earlier than the 2001–2020 average breakup date of May 19 (Appendix B3). The first Chinook salmon caught in the LYTF was on June 4; however, Chinook salmon were counted at Pilot Station sonar on May 31 during the first day of operations. Based on travel time, the first Chinook salmon counted at Pilot Station sonar probably passed Emmonak on May 28, which would be 2 days earlier than the 2001–2020 average date, May 30. The first summer chum salmon was caught on May 30, 2 days earlier than the 2001–2020 average date of June 1 (Appendix B3).

The LYTF 8.5-inch set gillnet ended on July 12 in the South Mouth. The cumulative Chinook salmon CPUE for the Big Eddy set gillnet was 29.82 (Appendix A3). The first quarter point of the set net was June 14, midpoint was June 20, and third quarter point was June 25. The 8.25-inch drift

gillnet projects for Chinook salmon operated in the South Mouth and Middle Mouth until July 15 and provided valuable supplemental run timing information for Chinook salmon entering the Yukon River. The combined cumulative Chinook salmon CPUE for the South Mouth and Middle Mouth drift gillnet sites was 64.89 (Appendix A4). The combined first quarter point, midpoint, and third quarter points of the drift gillnets were on June 5, June 18, and June 30, respectively. The 5.5-inch drift gillnets for summer chum salmon at both the South Mouth and Middle Mouth sites also concluded operations on July 15 (Appendix A5). The combined cumulative chum salmon CPUE for the South Mouth and Middle Mouth drift gillnet sites was 191.90, below the historical median CPUE of 7,265.63. The first quarter point, midpoint, and third quarter point were June 21, June 28, and July 4, respectively. Chinook and summer chum salmon caught in the test fishery were distributed to locals in mostly lower Yukon communities, with emphasis given to elders and people unable to fish. This fish donation program was coordinated by ADF&G in Emmonak and with village tribal councils in nearby lower river communities.

The cumulative passage at the Pilot Station sonar was estimated at 124,845 Chinook salmon $\pm 10,831$ (90% CI; Appendix B4). This final passage estimate was below the 10-year average (2011–2020) of 170,753 fish (Appendix B4). Chinook salmon entered the river in 4 pulses consisting of 22,250, 53,670, 20,760, and 3,790 fish, respectively. The first quarter point, midpoint, and third quarter point for Chinook salmon at the Pilot Station sonar project were on June 19, June 29, and July 4, respectively (Appendix B5). The 2021 Chinook salmon run appears to have been 6 days later than average based on the midpoint at the sonar project.

An estimated 153,718 ($\pm 16,149$, 90% CI) summer chum salmon passed the sonar project near Pilot Station (Appendix B4), which was well below the 2011–2020 average of 1,937,317 fish for the project. The first quarter point, midpoint, and third quarter point were June 30, July 6, and July 11, respectively, which was probably 9 days later than average and the latest on record based on the midpoint at the sonar project (Appendix B6).

Environmental Conditions

Currently, environmental monitoring within the U.S. portion of the Yukon River are limited, and existing assessment programs are inadequate to quantify environmental effects on migrating and spawning salmon. Records from LYTF and Pilot Station sonar project sites remain the most reliable and consistent historical inseason data for the mainstem Yukon River. However, an assortment of Onset HOBO Data Loggers are also used throughout the Yukon River drainage and provide extensive temperature data. With the assistance of the USFWS – National Wildlife Refuge staff, loggers were once again deployed near the communities of Nulato and Galena, with new loggers deployed at Fort Yukon. Additional loggers were deployed near the Dalton Highway bridge by the ADF&G Division of Sport Fish and by sonar staff at Eagle.

Loggers at LYTF in 2021 recorded highly variable water temperatures, which came close to the bounds of the lowest historical temperatures for some periods. The highest water temperatures (by the time of season) occurred for a short time when daily temperatures averaged 17–18°C from July 19 to July 23. The historically warmest parts of the summer in mid-July were near or below the historical average temperature levels in 2021 (JTC 2022). The maximum daily water temperature reached 17.7°C during the entirety of LYTF operations from late May into September.

The temperature dataset at Pilot Station sonar project consists of 1996–2021 (excluding 2006) and is deployed primarily from early June into early September. Pilot Station sonar temperature loggers encountered similar temperatures to LYTF and the maximum daily water temperature of 18.4°C

on July 19. The temperature dataset at the Eagle sonar project consists of 2005–2021, primarily from early July through October 6. At the Eagle sonar site, the temperatures in 2021 had 2 peak events: on July 23 at 19.5°C and August 5 at 19.0°C. The Eagle sonar sites generally experienced temperatures above the historical average (time of season) in July and August 2021, but the dataset is short. Although not all were deployed early in the season, other temperature loggers had no indications of prolonged elevated temperatures occurring during the salmon migration in 2021.

Summer Season Subsistence Fishery

Based on preseason forecasts, managers expected the Chinook salmon run to be poor, and the summer chum salmon run to be below average. The preseason strategy included closing subsistence fishing shortly after ice out. This closure was implemented before the first pulse of the run and was intended to protect the first half of the run until more information could be gathered on the run size. Due to the low outlook and the failure of the run to meet escapement goals in 2020, management was additionally conservative in 2021.

In most districts, the normal regulatory schedule consists of 2 fishing periods per week but varies by duration and days of the week (Appendix C1). However, due to the low abundance of salmon, closures began on June 2 in the Coastal District and District 1 and progressed upriver based on run timing (Table 2). During the salmon fishing closures, fishers could use nonsalmon gear, including 4-inch or smaller mesh gillnets restricted to 60 feet in length. Nonsalmon fishing opportunities remained open 24 hours a day, 7 days a week. Fishers were asked to release all Chinook and summer chum salmon from nonsalmon gear whenever possible and to avoid fishing in areas where salmon could be caught.

Around the typical midpoint of the run (June 23) at the Pilot Station sonar, the Chinook salmon run projection indicated that the drainagewide run size was too weak to meet escapement goals and provide any harvestable surplus. Although there was a higher than average proportion of Canada-origin fish, the overall run was too weak to support harvest. A conservative approach was warranted based on the lower than expected passage of Canada-origin Chinook salmon at the border in the last 2 years. In 2021, a similar pattern emerged, and despite fishing closures, on July 28 at the Eagle sonar project (the midpoint based on late timing), projections for Chinook salmon passage were below the lower end of the IMEG.

Cumulative summer chum salmon counts at the Pilot Station sonar were the lowest ever observed in the project's history (1995–2021). To protect summer chum and Chinook salmon, all salmon fishing remained closed, and selective gear types were only open for nonsalmon species. A few summer chum salmon continued to enter the river during the first part of the fall season. However, on July 18, the crossover date between summer and fall seasons, less than 153,500 summer chum salmon had been counted at the sonar, which was well below the historical cumulative median of 1.6 million fish and the drainagewide escapement goal of 500,000 fish.

Over the last several years, Yukon River stakeholders have exhibited incredible flexibility in complying with schedule changes and gear restrictions. ADF&G acknowledges the continued commitment made by stakeholders to conserve salmon resources. Managers rely heavily on input from stakeholders postseason about how management strategies worked and did not work for their area.

Summer Season Commercial Fishery

Due to very poor summer chum salmon abundance and subsistence fishery closures, no commercial periods occurred in 2021 in the lower or upper Yukon River districts (Table 1). Similar to 2001, there was no commercial harvest of summer chum salmon. For the 14th consecutive year, no commercial periods targeting Chinook salmon were allowed in the Yukon management area during the summer season (Appendix D9).

Lower Yukon Districts

There were no commercial openings, and no summer chum or pink salmon were sold (Tables 1, 3, and 4; Appendices C3 and C6). The summer chum harvest was below the 5-year (2016–2020) average harvest of 380,014 fish and was the lowest harvest since 2001 when the last closure occurred (Appendix C3). No commercial periods occurred during the fall season.

Fall Chum and Coho Salmon Assessment

ADF&G monitored a suite of assessment projects in the lower river that provided fall chum and coho salmon run timing, relative abundance, and stock composition information. Projects operated included 2 drift gillnet test fisheries that provided timing information and relative abundance and a mainstem Yukon River sonar near Pilot Station that provided abundance estimates. Genetic samples collected from chum salmon at the Pilot Station sonar provided stock composition information. Escapement projects were operated in the upper Yukon River tributaries and the upper mainstem of the Yukon River. Assessment projects in the upper river included a sonar in the mainstem Yukon River near the U.S./Canada border, a sonar above the Porcupine River border near Old Crow Yukon Territory, and a weir/sonar/video on the Fishing Branch River (Porcupine River headwater). Data from these projects were analyzed collectively inseason, used to verify and corroborate assessments between projects, and were further used to determine whether escapement goals would be achieved. Age, sex, and length information were collected at the 3 lower river test fisheries, mainstem Yukon River sonar (Eagle), and Fishing Branch and Delta Rivers.

By regulation, the fall season began in District 1 on July 16, and chum salmon caught in the lower Yukon River drift gillnet test fishery (LYTF) after July 16 were considered fall chum salmon. In the fall season, the LYTF changed methods to match Padilla and Gleason (2017). The Mountain Village drift gillnet test fishery (MVTF) is operated to provide additional information about the run between the LYTF and Pilot Station. In 2021, the MVTF began operating on July 18 using methods from Sandone (2020), and the mainstem Yukon River sonar operated near Pilot Station began counting fall chum salmon on July 19. The subsequent transition of upriver districts and subdistricts to the fall season was based on the migration timing of fall chum salmon. The LYTF ended on September 10; the project operated with Yukon Delta Fisheries Development Association throughout the season. Attempts were made this season to conduct morning and evening drifts at Middle Mouth sites; however, stormy weather interrupted drifts on 16 days, of which 6 days were inoperable. The total cumulative CPUE for fall chum salmon of 125.72 was well below the historical average (2001–2020) of 1,588.86 (Appendix A6). The MVTF ceased operations after September 12 with a cumulative CPUE for fall chum salmon of 450.29, which was well below the historical median of 2,038.58 (AYKDBMS). MVTF transitioned to new fishing sites in 2019 that were used again in 2021; however, the cumulative CPUE for fall chum salmon was the smallest ever recorded in all years of operation. Because it is farther inland, MVTF drifts were only affected by bad weather on 6 days, and 1 day was inoperable due to storms.

After observing the extremely low return of summer chum salmon, the fall chum salmon run was followed by a weak entry pattern. After July 19, 6 groups of chum salmon entered the Yukon River (Gleason 2021; Appendix A9). The mainstem Yukon River sonar near Pilot Station ceased operations on September 7. The chum salmon passage estimate at the mainstem sonar project near Pilot Station was 146,197 fish, which was well below the historical median (1995, 1997–2008, 2011–2020) of 723,000 fish. (Appendix B4). Applying genetic mixed stock analysis (MSA) to all the chum salmon that passed the mainstem sonar after July 18, the estimated number of fall chum salmon was 102,000 fish.

Inseason run size adjustments used in management decisions account for the proportion of summer chum salmon in the run. There were few samples from low catches during the first stratum July 19 through August 5, which was a longer timeframe than normal. The first stratum contained a mixture of summer and fall chum salmon. However, all strata after that were dominated by fall chum salmon. The run size tracked below the 300,000 fall chum salmon threshold necessary to allow subsistence fishing for fall chum salmon throughout the season. Run timing for fall chum salmon in the lower river assessment projects was 4 days later than average, and upriver escapement projects were only 2 days later than average (Appendix B7).

Coho salmon appeared to be extremely weak or late through the entire run, and most of the run entered in the last week of August into the first week of September (Appendix A10). The cumulative run size for coho salmon based on the mainstem sonar near Pilot Station and very little harvest downstream was tracking well below 2020 and the historical median (1995, 1997–2008, 2010–2020) throughout the season. The index of coho salmon run size was estimated to be 45,500 fish, the lowest on record and below the historical median of 213,000 fish. The total cumulative CPUE for coho salmon at the LYTF and MVTF were record lows (Appendix A6). Run timing for coho salmon was approximately 5 days later than average across all the assessment projects (Appendix B8).

Subsistence Fisheries and Personal Use Fisheries

The preseason forecast was revised to a preseason run size projection in mid-July, using the relationship between historical summer and fall chum salmon run size estimates. Based on an estimate of 157,000 summer chum salmon, the preseason drainage projection for fall chum salmon was a run size of less than 200,000 fish.

In accordance with the *Yukon River Fall Chum Salmon Management Plan*, all fishing (subsistence, personal use, sport, and commercial) was closed from the beginning of the fall season. This was the first time in history that all fishing for fall chum salmon was closed for the entire fall season. As the season progressed, the fall chum salmon run projection dropped to 102,000 fish compared to an average run size of 1 million fish. Coho salmon also returned at a record low abundance, and only 37,000 fish passed the mainstem sonar.

Managers coordinated with fishery participants and YRDLFA inseason teleconference callers to find ways to provide opportunities for other salmon species. Initially, subsistence fishing was provided using selective gear types (dip nets and hook and line) for pink, sockeye, and coho salmon in the lower Yukon management area. When using selective gear, all chum and Chinook salmon must be released alive. Fishing for important nonsalmon species, such as northern pike, whitefishes, and burbot remained open throughout the Yukon River drainage with various gears, including 4-inch or smaller mesh gillnets.

On August 28, further management actions were taken to reduce the incidental harvest of fall chum and coho salmon while opening additional nonsalmon opportunities. It had become apparent by this time that the coho salmon return was much lower than initially expected. Therefore, coho salmon were strongly recommended to be released, and the other selective gear types were closed for pink, sockeye, and coho salmon. It became apparent that the body size of fall chum and coho salmon was the smallest observed in the historical datasets, and the percentage of female fall chum salmon was trailing about 10% below average in lower Yukon assessment projects. Due to the higher probability of encountering smaller-bodied salmon and females, 4-inch or smaller mesh gillnets used to target nonsalmon species were placed on a reduced schedule and restricted to a maximum length of 60 feet to allow more salmon to reach their spawning grounds. Subsistence fishing opened with monitored fish wheels for nonsalmon drainagewide. Fall chum salmon were required to be released alive immediately.

Starting October 1, subsistence salmon fishing restrictions were lifted in the Coastal District and District 1. Restrictions were subsequently lifted in upriver districts and subdistricts as the tail end of the fall chum salmon run reached those areas. Important spawning areas for fall chum and coho salmon in Yukon River drainage tributaries remained closed to subsistence salmon fishing through the end of December to protect spawning salmon.

The preliminary subsistence harvest of fall chum salmon was estimated to be no fish, which is well below the 2016–2020 average of 60,911 fish (Appendix C4). The preliminary subsistence harvest of coho salmon was estimated to be 296 fish, well below the 2016–2020 average of 6,077 fish (Appendix C5). These unprecedented subsistence harvest levels created extreme hardships for subsistence users relying on the resource.

Fall Season Commercial Fisheries

The 2021 Yukon River fall chum and coho salmon runs were the lowest on record. The fall chum salmon run size did not meet the threshold of 300,000 fish needed to allow subsistence, personal use, sport, or commercial fishing per the *Yukon River Drainage Fall Chum Salmon Management Plan* (Appendices D12–D15). The threshold for any fall chum salmon commercial fishing is 550,000 fish. Additionally, the coho salmon and pink salmon-directed commercial fisheries did not occur because the thresholds and escapement goals for fall chum salmon were not met (Appendices D16–D18) under the *Yukon River Coho Salmon and Pink Salmon Management Plans*. Similar to the closures in 2020, commercial fishing remained closed during the fall season in the Yukon River drainage for the second time since 2002 (Appendices C4 and C5).

Yukon Management Area Subsistence and Personal Use Salmon Harvest

Subsistence salmon household harvest survey (survey) and permit programs collected quantitative information on salmon harvest by species, gear types used to harvest salmon, harvest distribution, miscellaneous species harvest, number of dogs, and whether salmon is harvested for dogs. Qualitative information was collected from households about salmon health and quality, subsistence fishing success, and fishery concerns. Subsistence permits are required in portions of the Yukon management area that are road accessible, including the Tanana River drainage, segments of the Koyukuk River, and the upper Yukon River in District 5. Subsistence salmon harvest estimates were derived by adding survey estimates, subsistence permit data, test fishery donations, and commercially retained salmon for personal use. The preliminary 2021 Yukon management area subsistence and personal use salmon harvest estimates were 1,995 Chinook, 1,266 summer chum, 705 fall chum, and 296 coho salmon (Table 1). In 2021, an estimated

276 households participated in the Yukon management area subsistence and personal use fisheries; 74% used set gillnets, 17% used drift gillnets, and 1% used fish wheels as the primary gear types (Table 5). The remaining 8% of households used other gear such as beach seines and dip nets.

Subsistence Survey

The survey employed a stratified random sampling technique to select Yukon management area households to be interviewed during 2021 (Cochran 1977). Harvest estimates were determined by sampled households and the harvest level (e.g., does not fish, low, medium, or heavy harvesters). Estimates were expanded to include households not interviewed for a complete estimate of a community's harvest; Padilla et al. (2021) discussed associated errors in survey estimates. Due to travel restrictions in response to the COVID-19 pandemic, subsistence salmon harvest surveys were conducted via telephone, mail, and the internet. An electronic survey provided subsistence users an avenue to self-report harvests online. An attempt was made to contact all known households to improve the response rate. The survey questions largely remained the same as in previous years. Excluding permit data, the 2021 estimates and 95% CI were 784 ± 139 Chinook, 738 ± 205 summer chum, 124 ± 49 fall chum, and 95 ± 60 coho salmon. Estimate results and 95% CI are preliminary and may change when additional quality control measures are conducted. Survey estimates are a subtotal of the overall subsistence estimates provided above, and 95% CI only applies to survey estimates (Table 5). In addition to the survey estimates, 825 Chinook, 512 summer chum, 558 fall chum, and 125 coho salmon, distributed by test fishery projects, were added to the relevant communities (Table 5). Test fishery donations do not have an associated error because they are considered exact reports. Due to the unprecedented low runs, salmon were donated to communities from various fisheries outside the Yukon management area and were documented on the survey. Households were asked to estimate the number of salmon donated from these fisheries. A total of 3,805 salmon were reported as donated from outside the Yukon management area but were not added to community harvests.

During the survey, households could comment on any topic related to fishing that they felt was important. The largest group of comments discussed dissatisfaction with management, such as a desire for more or longer openings for salmon (425 responses). The second most numerous group of comments mentioned dissatisfaction with the salmon runs (86 responses). The third largest group of comments (28 responses) mentioned equipment issues, such as boats or nets. Comments discussing satisfaction with management actions (25 responses) and personal circumstances that affected an individual household's fishing effort, such as health problems, work schedules, and time conflicts with other activities (16 responses) were the fourth and fifth largest groups, respectively. River conditions and weather, mainly comments about water levels, were discussed by 9 households. Several households mentioned expenses (5), animals (4), disease (3), conservation (3), or dogs (3).

Subsistence Permits

Subsistence permits are used to assess harvest in road accessible communities. Excluding the northern pike-specific permit in the Tolovana River drainage, 258 subsistence permits were issued in 2021 to harvest salmon and nonsalmon species. As of April 01, 2022, 97% of the subsistence permits issued were returned, and 56 permits reported fishing harvest (Appendices C7 and C8). There is no error associated with estimates of permit harvest because they are considered exact reports. Stevens Village residents have both permit and nonpermit (subsistence survey) fishing areas nearby and may choose to participate in either or both fisheries; to avoid double counting,

salmon harvest from this community is primarily estimated using the survey (Padilla et al. 2021). Households that returned subsistence permits reported harvesting 386 Chinook, 15 summer chum, 22 fall chum, and 76 coho salmon (Appendices C7 and C8). The number of subsistence permits issued in 2021 was 17% below the 2016–2020 average, and 14% was below the 2011–2020 average.

Amounts Necessary for Subsistence and Historical Trends

One method for assessing the relative success of Yukon management area fishery is to compare the annual estimated Yukon management area subsistence harvest (permits and surveys) to historical averages and the “amounts (reasonably) necessary for subsistence” (ANS) harvest ranges established by the BOF (ADF&G 2001; Estensen et al. 2015). The ANS levels outlined in 5 AAC 01.236 are 45,500–66,704 Chinook; 83,500–142,192 summer chum; 89,500–167,900 fall chum; 20,500–51,980 coho; and 2,100–9,700 pink salmon. Subsistence harvests of pink salmon were within their ANS ranges, whereas subsistence harvests of the other salmon species in 2021 were below the lower level of their ANS ranges. When comparing to ANS, subsistence salmon harvest estimates do not include salmon harvested from personal use permits or salmon retained from commercial fisheries for personal use. The years of data included to derive ANS do not include years when there are fishery restrictions for a species, and current year management actions should be considered when comparing current year harvest to ANS levels.

The 2021 harvests of Chinook, summer chum, fall chum, and coho salmon were the lowest on record. Subsistence salmon harvest estimates indicated that the 2021 Chinook salmon subsistence harvest was 94% below the 2016–2020 average and 89% below the 2011–2015 average (Appendix C9). The summer chum salmon subsistence harvest was 98% below the 2016–2020 average and 99% below the 2011–2015 average (Appendix C10). The harvest of fall chum salmon was 99% below the 2016–2020 average and 99% below the 2011–2015 average (Appendix C11). Coho salmon harvest was 95% below the 2016–2020 average and 98% below the 2011–2015 average (Appendix C12). Pink salmon harvest was 41% below the 2011–2020 average and 2% below the average harvest in odd-years between 2011 and 2019 (Appendix C13). Overall, the 2021 Yukon management area subsistence salmon harvest of 4,262 Chinook, summer chum, fall chum, and coho salmon combined (Appendices C9–C12) was 98% below the 2016–2020 average of 186,671 fish and 98% below the 2011–2015 average of 228,200 fish. This 10-year period includes years of very low harvests and fishing restrictions, such as closures during the 2011–2020 summer seasons to protect Chinook salmon.

Personal Use Harvest

A household permit is required for personal use fishing in the portion of the Tanana River drainage within the Fairbanks Nonsubsistence Area, Subdistrict 6-C (Appendices E13 and E15). Fishery participants must document their daily personal use harvest of salmon and nonsalmon on household permits and return them to ADF&G at the end of the season. Similar to subsistence fishing permits, demographics are documented, including numbers of permit holders, household members, primary gear type, number of dogs owned, and whether salmon is harvested for dogs (Padilla et al. 2021).

In 2021, 45 personal use salmon and 25 personal use whitefish permits were issued. As of April 01, 2022, 99% of personal use salmon permits were returned, and 2 reported fishing. No salmon were caught (Table 4; Appendix C14). The number of personal use permits issued in 2021 was 45% below the 5-year average (2016–2020) and 34% below the 10-year average (2011–2020). Most of

the personal use nonsalmon harvests are from the directed whitefish and sucker fisheries using various approved gear types to minimize salmon harvests (Appendix C14).

Sport Fishery

Alaska sport fishing efforts and harvests are monitored annually through the Statewide Harvest Survey (SWHS), an annual survey of households where at least 1 person purchased a sport fishing license. Harvest estimates are not available until approximately 1 calendar year after the fishing season, usually in the fall. Therefore, 2021 estimates were not available for this report. The Division of Sport Fish breaks the Yukon River into 2 management areas: the Yukon management area, which excludes the Tanana River, and the Tanana River management area. The Sport Fish Yukon management area is not to be confused with the Yukon management area used in subsistence and commercial reporting, which includes the Tanana River. Due to poor runs during 2021, the sport fishery for Chinook salmon closed by EO on May 10 for the Yukon management area and June 24 for the Tanana River management area. Subsequently, chum salmon fishing closed on July 1, and coho salmon fishing closed on August 26 for the Yukon and Tanana River management areas. The 2016–2020 average sport fish harvest from the Yukon River, including the Yukon and Tanana River management areas, was an estimated 65 Chinook, 474 chum, and 583 coho salmon (Lisa Stuby, Sport Fish Biologist, ADF&G Division of Sport Fish, Fairbanks; personal communication, email, May 27, 2022).

ENFORCEMENT

The primary enforcement authority for ADF&G subsistence, personal use, and commercial fishing regulations within the Yukon management area is the Division of Alaska Wildlife Troopers (AWT) with the Alaska Department of Public Safety (ADPS). The USFWS Division of Refuge Law Enforcement and Bureau of Land Management or other agencies may be involved in enforcement operations covering the entire length of the river for both the Chinook and summer chum salmon runs. The following is the postseason summary of 2021 enforcement by agency.

Alaska Wildlife Troopers Summary

The lower Yukon management area was patrolled more heavily in 2021 using staff from the Bethel Post and several temporarily transferred troopers from Anchorage, Glennallen, and Aniak. There were reports of illegal set net fishing in Hooper Bay. AWT responded to the village and discussed the fishing with the local residents and government. It was reported that they were unaware their area was part of the “Yukon River” management area. Most residents claimed to consider themselves coastal and thought their fishing was more like the coastal villages to the south managed under the Kuskokwim office, which was much more permissive to fishing in the coastal waters in 2021. Most nets were voluntarily pulled after AWT’s visit, confirmed by follow-up patrols later that week and month. Boat availability is nonexistent in the local area, proving difficult for enforcement. Multiple patrols were done on the Yukon River below Marshal, and a few were conducted as far up as Anvik from the Bethel region. Warnings were issued to unmarked set nets, but no nets were encountered during closed periods that were not otherwise authorized by the numerous announcements published by ADF&G and USFWS. AWT observed good voluntary compliance during spot checks.

Fairbanks and other interior staff conducted patrols in the middle and upper Yukon. Patrols ranged from Galena to the Yukon border and were regularly scheduled with a full staff in the Fairbanks office and interior posts (excluding the former Galena AWT post). Patrols began in the Galena

area by aircraft as the fish arrived in the middle Yukon River area and followed the pulses up to the mouth of the Tanana River. Once the fish were in the Tanana River, boat patrols began during open periods to check gear for compliance, and during closed periods, to ensure seasons were being followed. Boat patrols continued upriver to the Fort Yukon and Eagle area after the fish passed the bridge. Violations were similar to past seasons and included failing to adequately mark gear, using oversized mesh, and fishing during closed periods (Justin Rogers, Alaska Wildlife Trooper, ADPS, Fairbanks; email communication, November 11, 2021).

USFWS Law Enforcement Summary

During the 2021 Chinook salmon closure on the Yukon River, the Division of Refuge law enforcement and the Office of Law enforcement conducted joint patrols. Patrols were conducted with a single boat staffed with 2 law enforcement officers. Patrols followed the first run of Chinook salmon from the mouth of the Yukon upriver to Beaver, Alaska. In total, the officers spent 54 work days on the river. During the patrols, there were 35 contacts made with people fishing on the Yukon River. Four warnings were issued for unmarked gear, and 1 unattended unmarked oversized net was pulled and left on the bank of the river (Holly Carroll, Fisheries Biologist, USFWS, Fairbanks; personal communication, email, June 2, 2022).

CANADA FISHERIES

A total of 322 Chinook and 21 fall chum salmon were harvested in the 2021 Canada Aboriginal fisheries (Table 1, Appendices C2 and C4). Other fisheries, such as commercial, domestic, and public angling, remained closed for the entire season.

Aboriginal Fishery

Mainstem Yukon River Chinook Salmon

Based on a preseason outlook for a below average run of 42,000–77,000 Canada-origin Yukon Chinook salmon and the probability that the run size would not be at the upper end of the range, several recommendations, and conservation measures were proposed for early fishing opportunities in the First Nation fisheries. These included initiating harvest activities in a conservative manner and directing harvest at smaller (younger) fish by using selective gear and release of larger (older) fish. Following a slow start to the season, inseason information from the LYTF and Pilot Station sonar projects indicated that the run was within the preseason forecast range, which would provide for a limited First Nation fishery. Ultimately, inseason Eagle sonar passage data did not align with Pilot Station sonar projections. As the run progressed, the Eagle sonar passage indicated that the IMEG was deemed unlikely to be met in 2021. Yukon First Nation governments were responsive to inseason information and followed conservative management plans throughout the 2021 season, resulting in a significantly reduced harvest compared to the long-term historical averages. The First Nation harvest in the Canada Yukon River mainstem drainage in 2021 was estimated to be 306 fish (Appendix C2). For comparison, the First Nations long-term (1961–2020) average harvest is 4,890 fish, the 10-year average (2011–2020) is 2,378, and the 5-year average (2016–2020) is 2,837 fish (Appendix C2).

Mainstem Yukon River Fall Chum Salmon

The preseason outlook for Canada-origin fall chum salmon in 2021 indicated a below average run of 136,000–191,000 fish. The border passage estimate at this run projection would place Canada management in the green zone; therefore, no restrictions were expected in the First Nation

fisheries. As inseason information became available, the revised forecast based on the relationship with summer chum salmon indicated that there were no available harvest shares for chum salmon. First Nation fisheries were asked to implement additional measures to conserve chum salmon (JTC 2022). The preliminary 2021 fall chum salmon harvest in the First Nation fisheries in the Canada mainstem drainage was estimated to be no fish (Appendix C4).

Porcupine River Chinook, Fall Chum, and Coho Salmon

Vuntut Gwitchin First Nation (VGFN) reported a total season harvest of 16 Chinook salmon for 2021. The 10-year average (2011–2020) was 208 Chinook salmon (Appendix C2). A total of 21 fall chum salmon were harvested in the Old Crow-based VGFN fishery, which was below the 10-year average (2011–2021) harvest of 1,808 chum salmon (Appendix C4). There was a reported harvest of 0 coho salmon in 2021 on the Porcupine River, where the 10-year average (2011–2020) is 31 fish (Appendix C5).

Other Fisheries

Commercial, domestic, and public angling fisheries occur in Canada if run sizes are sufficient. In 2021, the commercial Chinook, fall chum, and coho salmon fisheries remained closed throughout the fishing season (Table 1, Appendix C4; Gleason 2021; JTC 2022). Most commercial activity typically occurs in the lower Canada commercial fishery area located downstream of the Stewart River, where catch monitoring is conducted. The 2016–2020 average commercial harvest is 0 Chinook and 1,959 fall chum salmon (Appendix C4). Meanwhile, the 2016–2020 average harvest in the domestic fishery is 0 Chinook and 11 fall chum salmon (Appendix C4). Over the last 10 years, retention (harvest) of Chinook salmon in the public angling fishery was only permitted in 2011. Fall chum salmon are typically not targeted in the public angling fishery.

SPAWNING ESCAPEMENT

During each season, the salmon runs are monitored in terms of the number of fish that can make it past (or escape) the fisheries and reach their respective spawning grounds. Such monitoring of escapement provides for the following:

1. Determination of appropriate escapement levels or goals for selected spawning areas or management units.
2. Evaluation of escapement trends.
3. Evaluation of the effectiveness of the management program, which in turn forms the basis for proposing regulatory changes and management strategies.
4. Evaluation of stock status for use in projecting subsequent returns.

Escapement Goals

Escapement goals (EG) have been established for several Chinook, summer and fall chum, and coho salmon stocks or stock aggregates which spawn in Yukon River drainage streams or areas (Appendix B2). The underlying principle in establishing an EG is that it should allow for escapements necessary to conserve and sustain potential salmon production and be consistent with the *Policy for the Management of Sustainable Salmon Fisheries* (SSFP, 5 AAC 39.222) and *Policy for Statewide Salmon Escapement Goals* (EGP, 5 AAC 39.223). The EGs developed or modified through this process are primarily presented as ranges. EG ranges allow for uncertainty associated with observed variability in measurement, changes in climate and oceanographic conditions, and varying abundance within related populations of the salmon stock being measured. A BEG is

defined as an escapement range that provides the highest potential to produce maximum sustained yield. An SEG is defined as a level of the escapement, determined through an index or range of escapement estimates, that has provided a sustained yield over a 5- to 10-year period. Transboundary escapement goals for passage at the Alaska–Canada border were established by the provisions of the YRSA for mainstem Chinook salmon and mainstem and Porcupine River (Fishing Branch) fall chum salmon (JTC 2010). These goals are referred to as IMEG because they were provisionally established until the 2 parties can agree upon a formal BEG analysis. The JTC undertook a comprehensive multiyear review of the current Chinook IMEG and presented the Yukon River Panel with recommendations during the 2022 Panel preseason meeting. Discussions about establishing a new goal are still ongoing, and no decision has been made. Until a new Canada-origin Chinook escapement goal is established, the previous IMEG of 42,500–55,000 will be in place through at least the 2022 season.

Most Arctic-Yukon-Kuskokwim (AYK) Region escapement goals were originally set in the late 1970s or early 1980s. Many have been subsequently revised following updated policies and newer information and analytical methods. Yukon management area escapement goals were first documented by Buklis (1993), as required under ADF&G’s original escapement goal policy, and signed in 1992. These early goals were generally established using a simple escapement averaging methodology based on aerial survey counts. Following the adoption of the new policies (SSFP and EGP), several new or revised BEGs were established (Appendix B2). These included BEGs for Chinook salmon on the Chena and Salcha Rivers (Evenson 2002), which were reanalyzed in subsequent review cycles but not changed (Liller and Savereide 2018); and Chinook salmon SEG goals on the East Fork Andreafsky (Volk et al. 2009), West Fork Andreafsky, Nulato, and Anvik Rivers were based on aerial surveys (ADF&G 2004).

An SEG was established for summer chum salmon on the Anvik River (Clark and Sandone 2001) and was revised in 2004 (ADF&G 2004). In 2001, an SEG was established for summer chum salmon on the Andreafsky River (Clark 2001) and was changed to a lower-bound SEG based on a run reconstruction and spawner-recruitment analysis using a newer Bayesian statistical analysis (Fleischman and Evenson 2010). A drainagewide summer chum salmon BEG of 500,000 to 1,200,000 was adopted in 2016 (Conitz et al. 2015). A spawner–recruit analysis for summer chum salmon was completed for the 2019 BOF cycle because of a change to the Pilot Station sonar historical passage numbers (Pfisterer et al. 2017). Results were consistent with the previous summer chum salmon drainagewide analysis, and the goal remained unchanged (Liller and Savereide 2018).

In 2001, BEGs for Yukon River fall chum salmon were established for the Tanana, Delta, and Teedriinjik (Chandalar) Rivers (Eggers 2001). In 2004, the SEG for coho salmon was revised to a range based on a boat survey for the DCR (ADF&G 2004; Conitz et al. 2012). The drainagewide BEG for fall chum salmon was reanalyzed based on similar Bayesian methods with a new run reconstruction and was revised to an SEG with the same range (Fleischman and Borba 2009). These 2 revisions from BEG to SEG were not due to a lack of information; in fact, the newer analyses were more rigorous and better statistically defined. However, practical management considerations in both cases limit options for maintaining escapements below an upper bound. The Toklat River fall chum salmon goal was discontinued in 2010 due to environmental changes that altered the ability to survey the index area (Volk et al. 2009); however, the escapement data are still used as a component of the drainagewide analysis. At the January 2016 BOF meeting, the elimination of the Sheenjek River fall chum salmon goal and the upper Yukon River tributary

aggregate fall chum salmon goals were presented (Conitz et al. 2015). ADF&G has had no means to monitor the escapement into the Sheenjek River since 2012, and the Sheenjek River goal was a subset of the upper Yukon Tributary goal, rendering both goals unnecessary.

ADF&G undertakes a triennial review of salmon escapement goals in conjunction with the BOF meeting cycle. Chinook, summer chum, fall chum, and coho salmon stocks were reviewed for the 2019 BOF cycle. Based on previous years' reviews and goals established during the previous BOF cycle, either no change was recommended, or a BEG or SEG was recommended for each stock (ADF&G 2004; Brannian et al. 2006; Volk et al. 2009; Conitz et al. 2012; Conitz et al. 2015; Liller and Savereide 2018). No changes to Chinook, summer chum, or coho salmon goals were recommended in 2019.

In 2019, the BEG for fall chum salmon on the Tanana River was discontinued since there was no means to measure the goal. The Delta River, a tributary of the Tanana River, will be used as an index area for the Tanana River based on their historical relationship. Both the BEG goals were changed back to SEGs for the Teedriinjik (Chandalar) and Delta Rivers based on analysis of the updated escapement datasets using the percentile method (Clark et al. 2014). Delta River SEG range of 7,000–20,000 fall chum salmon was based on population estimates from 1974–2017. Teedriinjik River SEG range of 85,000–234,000 fall chum salmon was based on sonar escapement data from 1995–2017. Escapements in 2019–2021 were measured against the new goals.

Mixed Stock Analysis

Scale pattern analysis, age composition estimates, and geographic distribution were used by ADF&G on an annual basis from 1981 through 2003 to estimate the stock composition of Chinook and chum salmon in Yukon River harvests and for estimation of total run abundance. In 2004, the feasibility of using genetic MSA in replacement of scale pattern analysis to assess Chinook salmon stock composition was first tested (JTC 2012). Since that time, the development of genetic methods and techniques for Chinook and chum salmon stock identification in the Yukon River drainage has been ongoing (Flannery and Wenberg 2015; Lee et al. 2021). Identification of salmon stock composition using genetic techniques has been a useful tool for inseason fisheries management on the Yukon River.

Three stock groups have been identified for Chinook salmon within the Yukon River drainage. The lower and middle Yukon River stock groups spawn in Alaska and the upper Yukon River (Canada-origin) stock group spawns in Canada (Appendix B9). A retrospective analysis was conducted on prior year estimates for 2007 and 2018 using the 2014 baseline to provide consistency between strata and MSA methods (Clark et al. *In prep*). Estimates differ only slightly from those provided in the JTC 2022 report.

Analysis of MSA for each “pulse” or stratum of fish as they enter the river and the weighted number of fish by stock in each stratum from 2005 to 2021 has helped refine the management of the Chinook salmon run (JTC 2022). For instance, although it was formerly assumed that the Canada-origin stock represented half of the run, on average (2005–2021) it makes up 40% of the drainagewide run total (Appendix B9). It has also been reported that the first pulse often contained a higher proportion of Canada-origin fish. Although this is often true, the highest passage of Canada-origin Chinook salmon typically occurs in the second or third stratum (Appendix B9). This long series of observations has helped refine management strategies that more effectively spread harvest across the Chinook salmon run to avoid overharvesting any particular stock group.

In 2021, salmon tissues were taken inseason for MSA from 755 Chinook salmon collected from the test fishery at the Pilot Station sonar project. Inseason analysis by strata indicated the first stratum sampled (May 31–June 22) was 62% Canada-origin, the second stratum sampled (June 23–July 6) was 54% Canada-origin, and the third stratum sampled (July 7–August 6) was 35% Canada-origin (Appendix B9; JTC 2022). Genetic MSA on all samples, weighted for postseason passage, indicated that 54% of the samples were Canada-origin Chinook salmon. These analyses were used inseason, along with timing information, to project the size of the Canada-origin run. These projections influence inseason management actions and have helped assess whether or not border passage objectives will be achieved. The samples collected at the Eagle sonar are used by DFO for their management of Canada Chinook salmon stocks. Of the 376 Chinook sampled at Eagle sonar in 2021, 373 returned usable genetic stock identifications. Chinook from the 2021 sample were identified to middle of the mainstem Yukon River, including Teslin River (33.5%), Carmacks area tributaries (22.5%), Pelly River and tributaries (13.1%), Stewart River and tributaries (8.8%), Teslin watershed above Teslin Lake (7.7%), northern Yukon River and tributaries (6.4%), upper Yukon River and tributaries (5.1%), and the White River and tributaries (3.0%; JTC 2022).

There was no directed subsistence harvest sampling program in place for 2021. Therefore, genetic MSA results from prior year (2006–2018) subsistence harvest sampling programs, samples taken from the 2021 LYTF, and samples collected from the Pilot Station test fishery in mesh sizes 5.25-inch or less were used to inform the 2021 subsistence harvest composition. A total of 180 samples were collected from the LYTF and were used to determine the stock composition of the test fishery giveaway. The subsistence fishery was closed and restricted to 4-inch mesh gillnets or less to target nonsalmon. In order to represent the stock composition of fish harvested incidentally using 4-inch mesh or less, the 123 samples collected in mesh sizes 5.25-inch or less from the Pilot Station sonar project test fishery were applied to harvests from the Coastal District through District 3. Genetic MSA results from the prior year (2006–2018) subsistence harvest sampling programs were used to inform the 2021 subsistence harvest composition for Districts 4 through 5. Chinook salmon harvested in the Black River, Koyukuk drainage, Teedriinjik (Chandalar River), Birch Creek, and District 6 (Tanana River) are presumed to be U.S.-origin. Similarly, sport fishery harvests typically occurred in Alaska tributaries and were assumed to harvest few, if any, Canada-origin fish. "Genetic MSA results for 2021 indicate that the weighted U.S. harvest of Yukon River Chinook salmon was 15% Lower, 23% Middle, and 62% Upper (Canada-origin) stock groups. U.S. harvest composition for 2021 was above the 2016–2020 average for the Lower and Upper stock groups and below the 2016–2020 average for the Middle stock group (JTC 2022). Genetic MSA information is vital to produce brood tables and to forecast future returns of Chinook salmon to the Yukon River, which are based on the spawning escapement and returns of the Canada-origin stocks.

Genetic sampling of chum salmon harvest for MSA within most of the Yukon River drainage fisheries is lacking due to funding. The summer chum salmon stock groups in the Yukon River are not well differentiated from other Western Alaska stocks such as Kuskokwim and Norton Sound (Eggers et al. 2011); however, fall chum salmon can be separated into distinct stock groups, including a partition of Canada-origin stocks which are important to meeting treaty obligations. Genetic MSA from Pilot Station sonar project test fishery samples are used in fall season fishery management with consideration for all chum salmon stocks entering the river after July 19. Genetic stock groups include summer, Tanana, U.S. border (Teedriinjik, Sheenjek, and Draanjik Rivers), and total Canada-origin stocks (Canada mainstem and Porcupine River; JTC 2022).

Chum salmon genetic tissue samples were collected between June 7 and September 7 ($n = 453$ in summer season and $n = 739$ in fall season) from the test fishery at Pilot Station sonar. Results from the MSA were reported for each pulse or time stratum and distributed by email to fishery managers to be considered during management decision making (JTC 2022). For summer chum salmon after July 19, the summer composition was 58% lower group, 27% middle group, and 15% Tanana group. The summer Tanana component of the total summer chum salmon passage peaked at Pilot Station sonar during the sampling period of July 19–August 5, which was during the transition to fall season. Due to low abundances of chum salmon, sample sizes were low during the summer and fall seasons; 2 strata (normally 4) in the summer and 3 strata in the fall (normally 5). The first stratum (July 19–August 5) included the 2 largest pulses and contained a large portion of U.S. border (Teedriinjk, Sheenjek, and Draanjik) stocks. The run transition from summer to fall was nearly completed in the second stratum of the fall season (August 6–22) when 93% of the mixture was fall chum salmon. For fall chum salmon, 82% of the run was of U.S.-origin and 18% of Canada-origin. The composition of the U.S. contribution was 51% Tanana and 49% U.S. border (Teedriinjk, Sheenjek, and Draanjik Rivers). The composition within the Canada contributions was 33% White River with another 62% in other mainstem Yukon systems and <3% upper Porcupine River stocks. Analysis of the mainstem genetics of fall chum salmon collected at the Eagle sonar location is unavailable.

Aerial Survey Escapement Assessment Methods

The Yukon River drainage is too extensive for a complete assessment of all salmon spawning streams. Consequently, low level aerial surveys from single-engine, fixed-wing aircraft form an integral component of the escapement assessment program. The greatest advantage of aerial surveys is the cost effectiveness of obtaining escapement information throughout an extremely vast and remote area. Another advantage of aerial surveillance is that current or potential habitat-related problems arising from natural or human causes can be identified. Among the disadvantages are that results may be highly variable. Recently, helicopters have been used more often to increase the accuracy of counts because of the aircraft's maneuverability, but they are also limited in range and are more costly.

Variability in aerial survey accuracy is dependent upon several factors such as weather, water turbidity, the timing of surveys to peak spawning, aircraft type, survey altitude, the experience of both pilot and observer, and species of salmon being assessed. It is recognized that aerial estimates are generally lower than actual stream abundance due to these factors. Further, peak abundance measured by aerial survey methods is significantly lower than total spawning abundance due to the die-off of early spawners and the arrival of fish after the survey. Aerial estimates in a given stream may demonstrate a wide range in the proportion of fish being estimated from year to year. To the extent that this variability can be controlled, peak aerial counts may serve as indices of relative abundance to examine annual trends in the escapement.

Aerial escapement estimates are obtained from as many spawning streams as possible within the confines of fiscal, personnel, and weather constraints. However, selected spawning streams or "index areas," which represent a larger geographic area, have been identified and receive the highest priority. Index areas have been designated due to their importance as spawning areas, by their geographic location to other non-surveyable salmon spawning streams in the general area, or both.

2021 Summer Season Escapement

Chinook Salmon Total Run Size Estimation

Drainagewide Chinook salmon run

Calculating a drainagewide estimate of Chinook salmon abundance is an important part of estimating postseason success regarding the forecast's ability to predict actual run sizes. It is also an important postseason measure of the Chinook salmon that were available for escapement and harvest in the U.S. portion of the drainage, where a large portion of the run is made up of U.S.-bound stocks that do not travel to Canada to spawn. There are currently 2 rudimentary methods to calculate the drainagewide run for Chinook salmon.

Method 1: Use Canada-origin run size and extrapolate based on the proportion of run. The Canada-origin run size is a simple estimate derived postseason from the Eagle sonar passage estimate plus the estimated number of Canada-origin fish harvested below the sonar (JTC 2022). Historically, the drainagewide run was calculated by assuming the Canada-origin stock made up 50% of the run. To calculate the drainagewide run, the estimated total Canada-origin run was multiplied by 2 to create the drainagewide estimate. However, genetic MSA from Chinook salmon tissues collected from the test fishery at Pilot Station sonar (2005–2021) indicated the weighted season total Canada proportion has ranged between 31% and 54%, and the average run composition was 40% Canada-origin (Appendix B9). Since these genetic methods began in 2005, it is not possible to know whether there was a shift in the population that caused the Canada-origin stock to decline from 50% to closer to 40% or whether the difference is a result of the introduction of more accurate methods (DeCovich and Howard 2011). Method 1 is only used for years without Pilot Station sonar run abundance estimates (1982–1994, 1996).

Method 2: Use the season total Chinook salmon passage estimate derived at the Pilot Station sonar plus the harvest and escapement below the sonar. Harvest removed from fisheries below the sonar include Chinook salmon retained for personal use while commercial fishing and the subsistence harvest, which is estimated by the subsistence harvest survey project postseason from the coast up to and including the community of Pilot Station (Appendix B10). For escapement below the Pilot Station sonar, the East Fork Andreafsky weir count is doubled (Total Andreafsky River) to account for passage into the West Fork Andreafsky.

For years when the Pilot Station sonar was operational (1995, 1997–2018), the drainagewide run was estimated using Method 2. For years without sonar operations (1982–1994, 1996), there were no mainstem run abundance estimates, and the drainagewide run was based on Method 1. The 2021 drainagewide run size was approximately 129,000 Chinook salmon, which is the sum of an estimated 2,850 fish escapement below Pilot Station, 1,485 fish harvested, and the Pilot Station sonar count of 124,845 fish (Figure 3 and Appendix B10). The 2021 drainagewide Chinook salmon run of approximately 129,000 fish was within the preseason outlook range of 102,000–189,000 fish.

Chinook Salmon Escapement

The Pilot Station sonar project is used to estimate the daily upstream passage of salmon in the lower Yukon River, and although this is not an index of the escapement, these values are used postseason to reconstruct the total drainagewide Chinook salmon run size (discussed earlier). In 2021, the total Chinook salmon passage estimate at the Pilot Station sonar was $124,845 \pm 10,831$ fish (90% CI; Appendix B4). This passage estimate was below the 2001–2020 average of

approximately 180,000 fish (Appendix B4). A drift gillnet test fishery was operated as a component of the Pilot Station sonar project to monitor species composition and to collect biological information, including age, sex, and length (ASL) and genetic samples from fish passing the sonar project site. Mesh sizes ranging from 2.75-inch to 8.5-inch were fished daily to collect samples. The estimated age composition of 614 Chinook salmon caught in the test fishery was 2% age-4, 48% age-5, 45% age-6, and 5% age-7 fish (AYKDBMS). The sex composition of fish sampled was 50% female and 50% male; however, all sex identifications were made visually and are less accurate than internal sex identification methods (AYKDBMS).

Chinook salmon escapement in U.S. tributaries was assessed at 2 weirs and 2 counting towers in 2021. In 2021, all U.S. tributary Chinook salmon escapement goals were not met, and escapements for systems without goals were below average (Liller and Savereide 2018; Appendix B11). River conditions were favorable on the Chena and Salcha River systems this year and below average water levels during the summer season passage dates (late June to mid-August). Most assessment projects could get successful counts for nearly all days of operation. However, aerial surveys of the East and West Forks of the Andreafsky River, Anvik River, Nulato River, Gisasa River, and Henshaw Creek were not conducted due to record levels of rain and sustained poor weather in western and interior Alaska during early August survey dates. Due to logistical challenges resulting from the COVID-19 pandemic, the Gisasa River weir did not operate.

A drift gillnet test fishery was operated as a component of the Eagle sonar project to monitor species composition and to collect biological information, including ASL and genetic samples from fish passing the sonar project site. Four different mesh size gillnets (5.25-, 6.5-, 7.5-, and 8.5-inch) were fished daily to collect samples. The estimated age composition of 327 Chinook salmon caught in the test fishery was 2% age-4, 45% age-5, 49% age-6, and 4% age-7 fish (AYKDBMS). The sex composition of fish sampled was 44% female and 56% male (JTC 2022).

Canada-origin Chinook salmon run

In order to calculate total runs for the Canada-origin run postseason and to assess whether border goals are met, harvests are added to spawning escapement, which are determined using Eagle sonar passage estimates as follows. The total Chinook salmon passage estimated at Eagle sonar in 2021 was 31,796 fish. After subtracting the estimated U.S. subsistence harvest taken upriver from the Eagle sonar site (38 fish) and the estimated Canada harvest of Chinook salmon (1,214 fish), the estimated mainstem border passage was 31,758 fish, and the estimated spawning escapement of Canada-origin Yukon River Chinook salmon (mainstem) was 31,452 fish (Appendix B12). This escapement was below the lower end of the IMEG of 42,500–55,000 fish. The total Canada-origin run size was approximately 32,972 Chinook salmon (Appendix B12), which was below the preseason outlook range of 42,000 to 77,000 fish and was well below what was expected at the border based on inseason run abundance using MSA at Pilot Station sonar.

With an estimated run size of 32,972 Canada-origin Chinook salmon, the TAC is calculated postseason, and the harvest shares for both countries (based on the YRSA) are determined (Appendix B12). The U.S. harvest share was 0 fish, and the Canada harvest share was 0 fish (Appendix B12). The U.S. harvest of Canada-origin Chinook salmon (1,214) exceeded the harvest share by 1,214 fish. The number of Chinook salmon that passed into Canada was 10,742 fewer fish than needed to meet the lower end of the IMEG range (42,500 fish) and provide for the minimum Canada harvest share. Despite a 2014–2018 trend of exceeding the border target, this

year marks the 8th time in 21 years (2001 to 2021) that the border target (escapement goal plus harvest share) has not successfully been met (Appendix B12).

Discussion of Summer Season Management Uncertainties

The run size estimate at Pilot Station sonar (Appendix B10) and the harvest of Chinook salmon in the subsistence fishery (Appendices C9) indicated a smaller than average run abundance of Chinook salmon drainagewide (Appendix B10). In addition, all U.S. tributary escapement goals were not met, and all escapements were below average. However, the inseason estimate of 67,000 Canada-origin Chinook salmon based on genetic MSA and passage at pilot indicated we would have enough fish to attain the border objective of 42,500 plus the harvest share. Unfortunately, the Canada-origin total run estimate postseason (32,972, which includes the U.S harvest of that stock; Appendix B12), was approximately 34,000 fish less than the inseason estimate of 67,000 Canada-origin Chinook salmon. This is a large discrepancy between inseason run abundance and postseason run abundance. Harvest estimates, sonar estimates, and stock composition estimates (MSA) all have measured error and confidence intervals, and even the combined error from these methods do not explain this large discrepancy in estimated Canada run abundance inseason at Pilot Station sonar compared to postseason estimates using Eagle sonar. Although it is possible that the sonar at Pilot Station overestimated the abundance of Chinook salmon, a discrepancy of this magnitude has not often happened prior to the last 3 years. There was nothing indicating technical difficulties with the detection of all fish throughout the sonar range and nothing indicating a problem with the apportionment of the test fishery catches.

It is not certain why 2019, 2020, and 2021 inseason projections of Canada-origin Chinook salmon based on Pilot Station sonar passage and application of genetics did not align well with the estimates at the Eagle sonar. In recent years (2014–2018), inseason projection methods have provided enough information to enable managers to restrict harvest sufficiently to achieve or exceed the lower end of the border escapement IMEG and provide for the Canada harvest share. The U.S. harvest alone does not account for the difference between inseason projections and the abundance estimated at the border in 2019, 2020, and 2021. Based on preliminary harvest estimates and genetic analysis, an estimated 1,214 Canada-origin Chinook salmon were harvested in the U.S. in 2021 (Appendix B12). In 2019, high water temperatures were recorded throughout the Yukon River, and heat stress possibly contributed to en route mortality. However, in 2020, water temperatures were close to average, but high water levels were more notable, and increased levels of *Ichthyophonus* infections were observed (Stan Zuray, subsistence use, Tanana; personal communication, verbal, November 23, 2020). In addition, 1 confirmed case of *Ichthyophonus* out of 10 samples was documented on the Salcha River (Ferguson and Ockerman 2021). *Ichthyophonus* infections combined with high water levels may have contributed to an increased level of en route mortality of Chinook salmon headed for Canada in 2020.

The prevalence and severity of *Ichthyophonus* disease in Yukon River Chinook salmon were investigated in 2021. Preliminary results of 200 samples taken from the first year feasibility study at the Pilot Station sonar indicate that the prevalence of *Ichthyophonus* infections in 2021 was 44%. This prevalence was similar to peak levels observed in the past when baseline sampling was in place and above the threshold level identified by the JTC of 25% to establish a monitoring program. Of the 185 samples genetically grouped to country of origin, 47% were Alaska stocks, and 45% were Canadian stocks. In addition to quantifying the prevalence of infections, this study is also estimating the level of intensity or severity of those infections, and preliminary results indicate the intensity levels may be unprecedented or higher than previously documented for this

system. Samples were also collected from subsistence-caught Chinook salmon at Rapids and of the 68 fish sampled, the level of prevalence was 39%, and all samples were taken from 4-inch mesh or less gillnets. Although the number of fish that die during migration before making it to the border cannot currently be measured, more research is being planned in this area for the 2022 season.

Canada escapements

In Canada, Chinook salmon were enumerated in Big Salmon River using an Adaptive Resolution Imaging Sonar (ARIS) Explorer 1800 multibeam sonar located approximately 1.5 km upstream of its confluence with the Yukon River. The 2021 count of 1,958 Chinook salmon was the third lowest recorded and below the 10-year average passage (2011–2020) of 5,048 Chinook salmon for Big Salmon River (Appendix B14). Carcass sample collection efforts in 2021 were truncated due to high water levels and turbidity, and consequently, no samples were collected (JTC 2022).

Sonars were used to estimate Chinook salmon escapement to the Pelly River system between July 1 and August 25, 2021. An ARIS Explorer 1800 multibeam (left bank) and an ARIS Explorer 1200 multibeam (right bank) sonar system were used to estimate the 2021 Chinook salmon passage. This was the sixth year of assessment undertaken by the Selkirk First Nation in collaboration with EDI Environmental Dynamics Inc. (EDI) at a site approximately 20 km upstream of the confluence of the Pelly and Yukon Rivers. In 2021, the estimated escapement in the Pelly River was 4,980 Chinook salmon (Appendix A11; JTC 2022). No fish were captured during test netting due to high water and equipment failures.

A single ARIS Explorer 1200 multibeam sonar system was installed on the right bank of the Klondike River to estimate the 2021 Chinook salmon passage. The 2021 season was the second year of assessment undertaken by the Tr'ondëk Hwëch'in First Nation and EDI following a trial year in 2019. This project is a continuation of sonar work conducted in 2009–2011 by Mercer and Associates, as supported by the Research and Education Fund (R&E). The 2021 sonar site was located near the Klondike River bridge, approximately 2.6 km downstream of the 2009–2011 site and 2.1 km from the confluence of the Klondike River with the Yukon River. Sonar operation began on July 1 and concluded on August 13, counting 843 Chinook salmon. A postseason expansion to August 22 brought the total estimate to 855 fish (Appendix B14; JTC 2022).

The Whitehorse Rapids Fishway is a fish ladder that bypasses the Whitehorse dam. It has a viewing window and fish trap that allows for salmon counts without handling fish. Whitehorse Rapids Fishway staff counted 274 Chinook salmon in 2021 (Appendix B14). This escapement was below the 2011–2020 average of 1,075 Chinook salmon and the second lowest recorded since 1976. Of these salmon, 98 (36% of return) were of hatchery origin, and 176 (64% of return) were wild origin. The hatchery component included 8 females and 90 males. The wild component included 41 females and 135 males. Female Chinook salmon made up 18% of the total return to the fishway (JTC 2022).

Summer Chum Salmon Escapement

Summer chum salmon escapement in the Alaska portion of the Yukon River drainage is monitored through a combination of weirs, towers, and sonar (Appendix B15). The 2021 summer chum salmon drainagewide escapement is derived from the Pilot Station sonar passage, Andreafsky River escapement, and drainagewide harvest. In 2021, the drainagewide escapement for summer

chum salmon was 158,869, well below the 2016–2020 average of 1,720,745 and the drainagewide goal of 500,000–1,200,000 fish (Appendix B16).

The 2021 summer chum salmon drainagewide total run size is derived from the Pilot Station sonar estimate plus the harvests of summer chum salmon below and the escapements of summer chum salmon into the East and West forks of the Andreafsky River. The drainagewide summer chum salmon run was approximately 160,135 fish, well below the 5-year (2016–2020) average of 2,173,693 fish (Appendix B16).

The summer chum salmon passage estimate at the Pilot Station sonar was $153,718 \pm 16,149$ fish (90% CI; Appendix B4). This passage estimate is well below the 5-year (2016–2020) average of 1,744,740 fish (Appendix B4). The sex composition of summer chum salmon sampled in the Pilot Station test fishery was 51% female and 49% male.

The East Fork Andreafsky River weir escapement estimate for chum salmon was 2,531 fish, which was well below the SEG of greater than 40,000 fish, and below the 10-year (2011–2020) average of 55,233 fish (Appendix B15). ASL data were collected from 234 fish caught in the weir trap. The estimated age composition was 0.9% age-3, 86.2% age-4, 10.3% age-5, and 2.7% age-6 fish. The sex composition of the fish sampled was 55.6% female and 44.4% male.

The Anvik River sonar escapement count of 18,819 summer chum salmon was the lowest on record and fell below the BEG range of 350,000–700,000 fish (Appendix B15) and was below the 10-year (2011–2020) average of 420,704 fish. Not enough fish were sampled to provide summary ASL data.

Counts at the other projects (Henshaw Creek weir, Chena River sonar, and Salcha River sonar) were well below the historical medians (Appendix B15). Both the Chena and Salcha River summer chum escapement estimates are considered incomplete because of late run timing and early project removal due to high water.

The Gisasa River weir did not operate in 2021 due to COVID-19 travel restrictions and staffing concerns, and aerial surveys were not conducted because of poor weather. Carcass sampling on the Salcha River was canceled due to low abundance of fish and high water during the peak spawning and carcass sampling periods.

The 2021 summer chum salmon run was the latest on record. The first quarter point, midpoint, and third quarter point at the Pilot Station sonar were June 30, July 6, and July 11, respectively. This indicated that the summer chum salmon run was probably 9 days later than average based on the midpoint at the sonar project (Appendix B6). Additionally, the first stratum (July 19–August 5) of genetic samples taken during the fall season indicated that over half of the chum salmon passage were still considered summer chum.

2021 Fall Season Escapement

Fall Chum Salmon Escapement

Fall chum salmon are discrete spawners choosing areas of upwelling and relatively warmer water to incubate their eggs in a shorter time when compared to other species. Major fall chum salmon spawning areas are in the Tanana, Teedriinjik, and Porcupine River drainages and within the Canada portion of the mainstem Yukon River drainage; monitoring projects concentrate on these areas (Appendices A11, B18, and B19). Drainagewide run size was determined based on coverage

of spawner distribution (escapement estimates), age composition, and estimates of harvest (Appendix B17).

Current escapement goals for the Yukon River drainagewide and individual tributaries or stock groups were developed based on the analysis done by Eggers (2001) with a recent modification of the drainagewide goal from a BEG to an SEG based on Fleischman and Borba (2009). From 2000 through 2013, the postseason run reconstruction and resulting drainagewide escapement estimate back to 1974 was derived from Eggers' (2001) method. Since 2014, a Bayesian state-space model was used to determine the drainagewide escapement (Fleischman and Borba 2009). The drainagewide escapement estimate for 2021 was a record low of 94,500 fall chum salmon, which is well below the SEG goal range of 300,000–600,000 fish. The model utilized historical escapement data from the Toklat, Delta, Teedriinjik, Sheenjek, Fishing Branch, and Canada mainstem Yukon Rivers, as well as mark–recapture estimates of abundance from the Kantishna and upper Tanana Rivers (Appendices B18 and B19). The model considers estimates from subdrainages in the dataset. The escapement for 2020 was also updated to the Bayesian value of 178,400 fall chum salmon, as the model performed better when the 2021 information was included.

Both 2020 and 2021 were the first years the drainagewide escapement goal was not achieved since the low runs observed in 1998–2000. In 2021, restrictions to fisheries reduced exploitation to as low as <1%, compared to previous lows in 4 even-numbered years between 1976 and 1984, which had extremely low escapements (based on current measures) but were mostly caused by high harvests of fall chum salmon, with exploitation as high as 60%. The current drainagewide SEG for fall chum salmon has been achieved 88% of the last 48 years and 89% of the 18 years since the range was established in 2004 (Appendix B17).

The historical (1974–2020) average drainagewide run size is 995,700 fall chum salmon and ranges between 184,000 fish in 2020 and 2,800,000 fish in 1975. From 1974 to 1991, fall chum salmon run sizes alternated consistently between lower even-numbered years, averaging 852,000 fish, and higher odd-numbered years averaging 1,400,000 fish. Since 1992, there appears to be a decadal cycle occurring where the fall chum salmon run peaked in 1995, 2005, and 2017, and was at lows in the cycles in 1992, 2000, and 2010. The new record low (2021) and the recent high (2017) abundances both occurred in the last decade. From 1974 to 2018, the largest fall chum salmon run occurred in 1975, the 2017 run is ranked the second largest, and the 2005 run is ranked third largest. These recent 2 large fall chum salmon runs came from very different productivity regimes; 2005 resulted from the highest ever production of an extremely poor escapement. However, the 2017 run was produced with above average returns per spawner from large escapements (Appendix B17).

The Tanana River produces the largest component of the drainagewide fall chum salmon run. Based on abundance estimates from mark–recapture studies conducted from 1995 to 2007 (Cleary and Hamazaki 2008), the Tanana River drainage contributes 21% to 41% of the overall run, averaging 32%. The estimated escapement in those years averaged 184,000 fall chum salmon with a range of 56,000 in 2000 to 373,000 fish in 2005. In 2021, there were no inseason assessment projects for fall chum salmon in the Tanana River. Genetic MSA with consideration of upriver harvests suggested the estimated escapement for the Tanana River was less than 43,000 chum salmon.

Evaluation of the fall chum salmon run to the Delta River, an index tributary of the Tanana River, was based on 7 replicate foot surveys conducted between October 5 and December 1, 2021. The

Delta River escapement was estimated to be 1,613 fall chum salmon (Table 6) based on the area under the curve using live counts from each survey week. The escapement was small, and the carcasses disappeared quickly, causing concern about using peak counts. This escapement level was a new record low and was well below the SEG range of 7,000 to 20,000 fall chum salmon in the Delta River.

The Teedriinjik River is the second largest component of the overall Yukon River drainage fall chum salmon run. Since 1995, the Teedriinjik River contribution of fall chum salmon has ranged from 22% to 41% and averaged 30%. The project has used various sonar types (split-beam during 1995–2006 and DIDSON [dual-frequency identification sonar] since 2007) to enumerate fall chum salmon passage (Melegari 2020). After applying the end of the season expansions to the historical data back to 1995, passage estimates of fall chum salmon have ranged from a low of 71,000 fish in 2000 to 527,000 fish in 2005 (Table 6, Appendices A10 and B18). In 2021, the project operated from August 22 to September 28, producing a preliminary cumulative count of 19,946 fish. However, because the project started later than the normal August 8 date, expansions were applied to both the beginning and the end of the run through the normal date of October 9. The resulting escapement estimate was 21,162 fall chum salmon and has become a new record low escapement, even well below the previous record low set in 2000 of 71,000 fall chum salmon. The 2021 estimate was well below the SEG range of 85,000 to 234,000 fish. Since 1995, fall chum salmon passage has met or exceeded the escapement goal in all years except 1998, 2000, and presumed failure in 2020.

In 2021, estimates of the Canada component included the mainstem Yukon River border passage which was assessed using sonars located downstream of Eagle Alaska. After the removal of U.S. and Canada harvests incidental harvests, the 2021 escapement was estimated to be approximately 23,170 fall chum salmon, which was well below the IMEG range of 70,000–104,000 fish. The low end of the goal has been achieved for 18 (2002–2019) of the past 20 years and exceeded the upper end in all but 2 of those years (Appendix B19).

The Fishing Branch River weir in combination with video and sonar enumeration, was operated at the weir site in 2021. The escapement project operated from September 7 through October 22 and estimated 2,413 fall chum salmon, which was well below the IMEG range of 22,000–49,000 fish (Appendices A10 and B19). The sonar project located on the Porcupine River near the U.S./Canada border (downstream of Old Crow) operated from August 15 to October 11. Passage at the sonar site was estimated to be 3,486 fall chum salmon (Appendix B19).

The Porcupine River systems include the Sheenjek and Fishing Branch Rivers; however, the assessment project on the Sheenjek River was discontinued in 2012, and the Fishing Branch River weir did not operate in 2013 and 2014. Before that, both projects contained estimates of the escapement to at least 1974 and, through time, were recognized as consistently weaker contributors to the overall drainagewide run. In years of high abundance (runs over 1 million fish and drainagewide escapements of over 650,000 fish), the individual goals are generally met.

Coho Salmon Escapement

Assessment of coho salmon spawning escapement is constrained in the Yukon River drainage because of funding limitations and marginal survey conditions during periods of peak spawning. The Pilot Station sonar does not provide a complete estimate of coho salmon passage because the project ceases operations before the end of the run. The passage estimate of coho salmon at Pilot Station sonar was 37,255 fish through September 7, 2021 (Appendices B4 and B20). Tributary

coho escapement estimate information was limited to portions of the Tanana River drainage. In 2021, escapements were below average in all areas of the Tanana River. The run reconstruction included the Pilot Station sonar plus downstream harvests, and it indicated the run size was below average for the index. The exploitation estimate was a record low of <1% due to the reduced harvest during fishery closures of commercial, subsistence, and personal use fisheries enacted to protect fall chum salmon.

Presently, only 1 escapement goal has been established for coho salmon in the Yukon River drainage. The Delta Clearwater (DCR), in the Tanana River drainage, has an SEG range of 5,200 to 17,000 fish (ADF&G 2004). The DCR spawning count was 913 coho salmon (Table 6) and was conducted by boat survey on November 2, 2021. This escapement estimate was below the escapement goal range. All coho salmon escapement surveys in the Nenana River and the upper Tanana River (evaluated by aerial surveys) were well below average compared to the 1911–2015 and 2016–2020 averages.

In recent years, a coho salmon run reconstruction index has been developed that expands the Pilot Station sonar passage estimates by comparing the timing of the next closest monitoring project in the lower Yukon River (LYTF or Mountain Village) using the appropriate lag for travel time. Further, commercial and subsistence harvests below the sonar site are included to provide an index of coho salmon abundance for the Yukon River. Subsistence harvest in this area is fairly stable, averaging 3,000 coho salmon annually. However, the commercial harvest can vary drastically (<1,000 to 177,000) depending on the management of the fall chum salmon fishery. This index does not include coho salmon spawning in tributaries below the sonar site. Currently, the data used for estimating the coho salmon run size index is based on the years 1995 and 1997 through 2021 (excluding 2009). This model results in an average (1995–2020) run size of 235,000 coho salmon in the Yukon River (Appendix B21). An index of Yukon River drainagewide escapement is derived from the run reconstruction minus the total harvest of coho salmon. The average escapement using this dataset was 163,000 coho salmon. In 2021, the run size index was estimated to be approximately 45,500 coho salmon with an estimated escapement of 45,000 fish (lowest on record) after the removal of 293 coho salmon harvested incidental to nonsalmon fishing opportunities (Appendix B21).

OTHER MARINE AND FRESHWATER FINFISH FISHERIES

SUBSISTENCE AND PERSONAL USE FISHERY

The estimated subsistence and personal use harvest of nonsalmon species in 2021 was 20,376 whitefish (*Coregonus* spp. and *Prosopium cylindraceum*), 13,319 northern pike (*Esox lucius*), and 5,033 sheefish/inconnu (*Stenodus leucichthys*; Appendix C15). Other species are only reported by total harvest as they are harvested in small amounts or do not occur during salmon season and include a total of 870 burbot (*Lota lota*), 707 “tomcod”/saffron cod (*Eleginus gracilis*), 338 Arctic grayling (*Thymallus arcticus*), 0 Arctic lamprey (*Lethenteron camtschaticum*), 75 longnose suckers (*Catostomus catostomus*), 16,669 Alaska blackfish (*Dallia pectoralis*), 5,289 Pacific herring (*Clupea pallasii*; Appendix C15). Due to the harvest patterns of nonsalmon species, these estimates are based on harvests from the previous winter’s harvest to the fall of the current year (e.g., 2021 estimates are based on harvest from winter 2020 to fall 2021).

Nonsalmon species (e.g., northern pike, sheefish, whitefish, blackfish, etc.) are an important subsistence resource for people in most areas throughout the Yukon River drainage, largely because they are available for harvest all season (Andersen et al. 2004; Brown et al. 2005). Many subsistence users harvest marine and freshwater finfish other than salmon as incidental bycatch or by directly targeting those species when fishing for salmon. Estimates of nonsalmon harvest are poorly understood at a species level throughout the Yukon River drainage. Thus, a comprehensive assessment of nonsalmon harvest and use by species has been identified as a research priority for the Yukon management area (Brown et al. 2012). Information about nonsalmon species is collected during the annual ADF&G postseason subsistence salmon harvest surveys but is ancillary to salmon-specific surveys. ADF&G documents harvest areas and gear types and quantifies nonsalmon species' harvest and use levels in 6 lower Yukon River region communities (Runfola et al. 2018). Similar efforts are underway in 5 Bering Sea coastal communities (Runfola et al. *In prep*); and recently, a multiyear radiotelemetry project studying burbot throughout the Yukon River drainage was concluded (Stubby et al. 2022). The objectives of this project were to document the spawning and migration patterns of burbot and the reliance on this species in culturally and geographically distinct regions.

A variety of fishing methods are used in the main rivers and coastal marine waters to harvest nonsalmon finfish. Beach seines are occasionally used near spawning grounds to capture salmon and other species of schooling fish. In the fall and winter months, various designs of fyke nets and fish weirs are used to capture whitefish, blackfish, and burbot. In the winter and spring months, hand lines are used through the ice to take sheefish, northern pike, and “tomcod” (saffron cod). The majority of the sheefish are harvested as they comigrate up the Yukon River with Chinook salmon. In the spring and early summer, smelt are harvested in the Yukon River Delta area using dip nets. During the fall months, dip nets and “eel sticks” are used to harvest Arctic lamprey in the mainstem Yukon River downstream of Grayling. Whitefish and sheefish are also harvested in fish wheels located in the upper Yukon and Tanana Rivers during salmon fishing.

COMMERCIAL FISHERY

Regulations allow ADF&G to issue Commissioner's permits for the commercial harvest of nonsalmon freshwater fish (e.g., whitefish, burbot, northern pike, blackfish, and Arctic lamprey) throughout the Yukon and Tanana River drainages. Commissioner's permits allow the commercial harvest of species not managed under existing commercial fishing regulations during discrete periods throughout the year. The issuance of a Commissioner's permit enables managers to collect and evaluate information relating to species composition of the commercial catch, the selectivity of the gear, and, to a lesser extent, population abundance. Each year, permit applications are reviewed by ADF&G. Requests for additional harvests, and current biological information are considered before the permits are issued.

Whitefish Fishery Summary

ADF&G has issued Commissioner's permits for an experimental whitefish commercial fishery in the lower Yukon River annually since 2005. In response to market preference, commercial permits were issued for the specific harvest of Bering cisco (*Coregonus laurettae*), and to a lesser extent least cisco (*Coregonus sardinella*), beginning in 2009. The exact dates of the fishery have varied each year in response to the seasonal movements of whitefish and river conditions; however, the commercial harvest generally occurs in September and October.

In 2021, one permit was issued to Kwik'pak Fisheries, LLC for the commercial harvest of Bering cisco and least cisco. The permit authorized a maximum harvest of 35,000 ciscoes (numbers of fish) in District 1 from September 10 to December 31 (data on file with ADF&G Division of Commercial Fisheries, Anchorage).

The permit stipulated that fishing gear was restricted to 1 set or drift gillnet with a maximum stretched mesh size of 4 inches, or 1 hand line (hook and line) per angler. The smaller mesh size would target cisco species while reducing the incidental harvest of sheefish and broad whitefish (*Coregonus nasus*). For the 2021 season, the fishing gear could not exceed that allowed by inseason management. In previous years, whitefish commercial gillnets were 150 feet in length; gear was restricted to 60 feet in length in 2021 to align with subsistence restrictions to protect salmon runs. Stakeholders were required to have a 2021 Commercial Freshwater permit (F04B) to participate in the fishery. Commercial fishing was prohibited in designated areas around the village of Kotlik to prevent commercial fishing from potentially affecting subsistence fishing.

A total of 29 freshwater permits were purchased by stakeholders from Yukon management area communities in 2021. Low catch rates of Bering cisco in subsistence gear, high numbers of beluga whales, and COVID-19 lockdowns hampered fishing activity near Emmonak in September (Mick Leach, Fish and Wildlife Technician, ADF&G, Anchorage; personal communication, email, September 30, 2021). Kwik'pak Fisheries, LLC intended to operate a commercial fishery for whitefish through the ice later in the winter, but poor ice conditions persisted into October (Mick Leach, Fish and Wildlife Technician, ADF&G, Anchorage; personal communication, email, October 15, 2021). No commercial deliveries were made in 2021; the number of permits fished was therefore below the 2016–2020 average of 16 (Appendix D19).

In the upper Yukon management area, commercial freshwater fisheries targeting whitefish occurred primarily through the 1970s. Since 1980, there have been sporadic small commercial harvests of whitefish in the upriver districts, and no commercial permits were issued in 2021. Permit authorization is not required for the sale of whitefish species taken incidentally during commercial salmon fishing in any district. In upriver districts, whitefish have been taken incidentally to the salmon harvest and sold since the late 1980s. In 2021, no salmon commercial fishery occurred in District 6, and no sales of freshwater finfish occurred (Appendix D20).

Arctic Lamprey Fishery Summary

Community contacts were established with local subsistence and commercial stakeholders in the villages of Alakanuk, Emmonak, Mountain Village, Pilot Station, Russian Mission, Holy Cross, and Grayling. Information regarding subsistence fishing effort, commercial fishing, harvest rates, local weather, river conditions, and run timing was gathered. An ADF&G representative also communicated with the processor for updates on harvest and quality.

Subsistence Fishery

Subsistence fishing efforts in 2021 were strong but unproductive. Despite the continuous effort from Mountain Village through Grayling and the presence of 20-inch-thick river ice in late November, no harvest was initially reported. Two lamprey were caught in dipnets in Mountain Village on November 10 and 11. No other lamprey harvests were reported during the monitoring phone calls. Subsistence lamprey harvest from 2021 will be assessed through postseason surveys in September 2022. Results from these surveys will be available in an annual subsistence harvest report by ADF&G.

Commercial and Test Fishery

Commissioner's permits allow commercial harvest of Arctic lamprey have been issued annually since 2003. The quota has varied over time, and the exact dates of the fishery have varied each year in response to run timing and ice conditions; however, the commercial harvest generally occurs in November and December.

From 2013 to 2021, local stakeholders have been contracted with the Yukon Delta Fisheries Development Association (YDFDA) to set up test fishery sites in District 1 to assess lamprey presence and run timing. Nets were checked daily unless weather conditions were poor and were pulled due to colder weather and the formation of slush and shore ice.

Test fishing in 2021 began on September 11 with the deployment of 6 fyke nets at areas around Flat Island, Munson Island, and Alakanuk. A total of 1,765 lamprey were caught. In addition to lamprey, the fyke nets caught 234 whitefish, 89 flounders, 78 smelt, 63 burbot, 6 sculpin, 4 tomcod, and 3 salmon. Nets were pulled between October 15 and 20, depending on the weather. The largest lamprey catches occurred between October 7 and October 9 (data on file with ADF&G, Division of Commercial Fisheries, Anchorage).

In 2021, one freshwater commercial fishery permit was issued to Kwik'pak Fisheries, LLC allowing a harvest of up to 44,092 pounds (20 metric tons) of Arctic lamprey. The permit was valid from September 10 through December 31. To participate in the fishery, stakeholders were required to have a 2021 Freshwater Commercial permit. Commercial fishing gear was restricted to 1 hand dip net, 1 "eel stick", 1 fyke net, or 1 hoop net per freshwater commercial permit holder (data on file with ADF&G, Division of Commercial Fisheries, Anchorage).

One commercial delivery was made from the test fishery catches for a total of 380 pounds of lamprey sold in 2021. The price paid to stakeholders was \$1.00 per pound, resulting in an estimated total harvest value of \$380. No commercial permits were fished in 2021 (Appendix D21). No lamprey samples were collected in 2017, 2018, 2020, or 2021. In previous years, a sample of commercially harvested lamprey were measured for length, sex, and weight.

CAPE ROMANZOF HERRING FISHERY

The Cape Romanzof Herring District consists of all Alaska waters from Dall Point to 62° N lat (Appendix E17). Pacific herring are present in coastal waters of the Yukon management area during May and June. Spawning populations occur primarily in the Cape Romanzof area in Kokechik Bay and Scammon Bay, where the spawning habitat consists of rocky beaches and rockweed *Fucus* sp. The arrival of herring on the spawning grounds is influenced by ocean water temperature and ice conditions. Typically, herring appear immediately after ice breakup. Spawning usually occurs between mid-May and mid-June.

Local residents harvest herring in Hooper Bay, Kokechik Bay, and Scammon Bay for subsistence purposes. A few stakeholders in the Yukon River Delta report harvesting herring along the coast near Black River and Kwiguk Pass for subsistence use. It is speculated that these herring are migrating toward southern Norton Sound. Some Yukon River Delta residents harvest herring spawn on kelp (*Fucus* sp.) north of Stebbins in southern Norton Sound. Information regarding the commercial herring fisheries in the Cape Romanzof District from 1980 to 2013 can be found in Estensen et al. (2015).

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TABLES AND FIGURES

Table 1.—Total utilization in numbers of salmon by district and country, Yukon River drainage, 2021.

District	Fishery	Chinook ^a	Summer chum ^a	Fall chum ^a	Coho ^a	Pink ^a
Coastal	Subsistence ^b	31	305	39	50	1,821
	Commercial	—	—	—	—	—
	Test fish sales	—	—	—	—	—
	Total	31	305	39	50	1,821
1	Subsistence ^b	731	354	141	31	556
	Commercial	—	—	—	—	—
	Test fish sales	—	—	—	—	—
	Total	731	354	141	31	556
2	Subsistence ^b	715	490	435	126	290
	Commercial	—	—	—	—	—
	Test fish sales	—	—	—	—	—
	Total	715	490	435	126	290
3	Subsistence ^b	33	81	0	0	0
	Commercial	—	—	—	—	—
	Total	33	81	0	0	0
Total lower Yukon management area	Subsistence ^b	1,510	1,230	615	207	2,667
	Commercial	—	—	—	—	—
	Test fish sales	—	—	—	—	—
	Total	1,510	1,230	615	207	2,667
4	Subsistence ^b	4	2	0	0	0
	Commercial	—	—	—	—	—
	Total	4	2	0	0	0
5	Subsistence ^b	424	17	71	33	0
	Commercial	—	—	—	—	—
	Total	424	17	71	33	0
6	Subsistence ^b	7	4	17	53	0
	Commercial	—	—	—	—	—
	Personal use	0	0	0	0	—
	Total	7	4	17	53	0
Total upper Yukon management area	Subsistence ^b	435	23	88	86	0
	Commercial	—	—	—	—	—
	Personal use	0	0	0	0	—
	Total	435	23	88	86	0
Total Yukon management area (Alaska)	Subsistence ^b	1,945	1,253	703	293	2,667
	Commercial	0	0	0	0	0
	Personal use	0	0	0	0	—
	Test fish sales	—	—	—	—	—
	Sport fish	0 ^b	0 ^b	0 ^b	0 ^b	0 ^b
	Total	1,945	1,253	703	293	2,667
Total Canada	Domestic	0	0	0	0	0
	Aboriginal (mainstem) ^b	306	0	0	0	0
	Test fish harvest	—	—	—	—	—
	Commercial	—	—	—	—	—
	Subtotal	306	0	0	0	0
	Porcupine Aboriginal	16	0	21	0	0
	Total	322	0	21	0	0
Grand total		2,267	1,253	724	293	2,667

Note: En dashes indicate fishery did not occur.

^a Commercial harvest includes fish sold in the round and headed and gutted.

^b Data are preliminary.

Table 2.—Summer season subsistence fishing openings and allowed gear, 2021.

District or Subdistrict	Subsistence salmon fishing closed ^a	4-inch or smaller mesh restricted to 60 feet in length ^a
South Coastal	June 2	June 2
District 1 and North Coastal	June 2	June 2
District 2	June 4	June 4
District 3	June 7	June 7
Innoko River	June 3	June 3
Koyukuk River	June 14 ^b	June 14
4-A Lower and Upper	June 13	June 13
4-B, 4-C	June 15	June 15
5-A, 5-B, 5-C	June 19	June 19
5-D	June 23 (lower), June 26 (middle), June 28 (upper)	June 23 (lower), June 26 (middle), June 28 (upper)
District 6	June 21	June 21

Note: Prior to the reduced schedule in each district, subsistence was open 24 hours a day, 7 days a week with 7.5-inch or smaller mesh gillnets. When a mesh size is listed, any smaller mesh sizes may be used.

^a During salmon fishing closures, all gillnets larger than 4-inch must be removed from the water and fishwheels may not be operated. Fall season fishing was also closed and not detailed here.

^b Fishing with 6-inch or less mesh gillnets was open from June 26 to June 30 near the Dulbi River to allow for the harvest of sheefish in a portion of the Koyukuk River prior to the arrival of the first pulse of Chinook salmon.

Table 3.–Chinook and summer chum salmon commercial harvest by district and period in the Yukon management area, 2021.

			Chinook salmon		Summer chum salmon			Pink salmon		
			Released alive	Number caught but not sold	Number	Pounds	Average wt.	Number	Pounds	Average wt.
Lower Yukon	District 1	Period								
		1	–	–	–	–	–	–	–	–
		District 1 subtotal:	NA	NA	NA	NA	NA	NA	NA	NA
	District 2									
		Period								
		1	–	–	–	–	–	–	–	–
Upper Yukon	Districts 4–6	District 2 subtotal:	–	–	–	–	–	–	–	–
		Lower Yukon management area, Districts 1–3 subtotal:	NA	NA	NA	NA	NA	NA	NA	NA
	Districts 1–6 total summer season:									

Note: Commercial fishing did not occur in 2021. En dashes indicate no data. NA = not applicable.

Table 4.—Commercial sales in number of salmon by statistical area, Yukon management area, 2021.

Statistical area	Chinook ^a	Summer chum ^a	Fall chum ^a	Coho ^a	Pink ^a	Total salmon
334-11	—	—	—	—	—	0
12	—	—	—	—	—	0
13	—	—	—	—	—	0
14	—	—	—	—	—	0
15	—	—	—	—	—	0
16	—	—	—	—	—	0
17	—	—	—	—	—	0
18	—	—	—	—	—	0
19	—	—	—	—	—	0
Subtotal District 1	—	—	—	—	—	0
334-21	—	—	—	—	—	0
22	—	—	—	—	—	0
23	—	—	—	—	—	0
24	—	—	—	—	—	0
25	—	—	—	—	—	0
Subtotal District 2	—	—	—	—	—	0
Total lower Yukon ^b	NA	NA	NA	NA	NA	0
Total upper Yukon ^b	NA	NA	NA	NA	NA	0
Grand total Yukon management area	NA	NA	NA	NA	NA	0

Note: En dashes indicate no data due to no commercial fishing activity. NA= not applicable.

^a Commercial harvest includes fish sold in the round and headed and gutted. Does not include ADF&G test fishery sales.

^b No commercial openings or harvest occurred in any district in the Yukon management area.

Table 5.—Subsistence and personal use salmon harvest estimates, including commercially related and test fish harvests provided for subsistence use, and related information, Yukon management area, 2021.

Community	Number of fishing households ^b	Number of dogs ^c	Estimated harvest				Primary gear used ^a			
			Chinook	Summer chum	Fall chum	Coho	Set gillnet	Drift gillnet	Fish wheels	Other
Hooper Bay	45	85	13	290	28	41	45	0	0	0
Scammon Bay	18	58	17	13	11	9	16	0	0	2
Coastal District total	63	143	30	303	39	50	61	0	0	2
Nunam Iqua ^c	10	24	78	16	3	4	8	0	0	2
Alakanuk ^c	28	99	229	66	22	8	24	2	0	2
Emmonak ^c	13	140	346	170	117	21	11	2	0	0
Kotlik ^c	6	116	78	102	1	3	6	0	0	0
District 1 total	57	379	731	354	143	36	49	4	0	4
Mountain Village ^c	13	60	152	39	137	37	6	7	0	4
Pitkas Point	10	33	13	21	0	0	7	3	0	0
St. Mary's ^c	35	81	220	74	2	0	4	31	0	0
Pilot Station ^c	6	100	321	344	296	74	6	0	0	0
Marshall ^c	4	116	9	11	0	15	0	0	0	0
District 2 subtotal	68	390	715	489	435	126	23	41	0	4
Russian Mission	7	41	24	49	0	0	7	0	0	0
Holy Cross	—	—	—	—	—	—	—	—	—	—
Shageluk	—	—	—	—	—	—	—	—	—	—
Other District 3 ^{c,d}	1	77	9	32	0	0	1	0	0	0
District 3 total	8	118	33	81	0	0	8	0	0	0
Lower Yukon River total	133	887	1,479	924	578	162	80	45	0	8
Anvik	—	—	—	—	—	—	—	—	—	—
Grayling	—	—	—	—	—	—	—	—	—	—
Kaltag	—	—	—	—	—	—	—	—	—	—
Nulato	—	—	—	—	—	—	—	—	—	—
Koyukuk	—	—	—	—	—	—	—	—	—	—
Galena	3	66	2	0	0	0	3	0	0	0
Ruby	—	—	—	—	—	—	—	—	—	—
Other District 4 ^c	1	294	2	0	0	0	0	1	0	0
District 4 Yukon River subtotal	4	360	4	0	0	0	3	1	0	0

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Table 5.—Page 2 of 3.

Community	Number of fishing households ^b	Number of dogs ^c	Estimated harvest				Primary gear used ^a			
			Chinook	Summer chum	Fall chum	Coho	Set gillnet	Drift gillnet	Fish wheels	Other
Huslia/ Hughes	2	87	0	2	0	0	0	0	0	2
Allakaket/Alatna/Bettles	0	79	0	0	0	0	0	0	0	0
Koyukuk River subtotal	2	166	0	2	0	0	0	0	0	2
District 4 total	6	526	4	2	0	0	3	1	0	2
Tanana	11	129	72	18	59	8	11	0	0	0
Rampart/Stevens Village ^{f,g}	2	76	5	0	4	21	2	0	0	0
Fairbanks (FNSB) ^{g,h}	20	144	315	10	1	2	20	0	0	0
Beaver	3	28	13	0	0	0	3	0	0	0
Fort Yukon/Birch Creek	7	373	5	0	7	0	4	0	0	3
Circle/Central ^g	2	105	5	0	0	0	1	0	1	0
Eagle ^g	3	107	38	0	0	0	3	0	0	0
Other District 5 ^{h,i}	5	186	22	5	0	0	2	0	0	3
District 5 Yukon River subtotal	53	1,148	475	33	71	31	46	0	1	6
Venetie/Chalkyitsik	0	140	0	0	0	0	0	0	0	0
Teedriinjik/Draanjik Rivers subtotal	0	140	0	0	0	0	0	0	0	0
District 5 total	53	1,288	475	33	71	31	46	0	1	6
Manley ^g	—	—	—	—	—	—	—	—	—	—
Minto ^g	0	8	0	0	0	0	0	0	0	0
Nenana/Healy ^{e,g}	5	103	6	4	17	49	3	0	2	0
Fairbanks (FNSB) ^{g,h}	—	—	—	—	—	—	—	—	—	—
Other District 6 ^{g,j}	16	291	1	0	0	4	12	0	0	4
District 6 Tanana River total	21	402	7	4	17	53	15	0	2	4
Upper Yukon River total	80	2,216	486	39	88	84	64	1	3	12
Alaska, Yukon management area total	276	3,246	1,995	1,266	705	296	205	46	3	22
Alaska, Yukon management area percentages of the total harvest			47%	30%	17%	7%	74%	17%	1%	8%

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Table 5.–Page 3 of 3.

Community	Number of fishing households ^b	Number of dogs ^c	Estimated harvest				Primary gear used ^a			
			Chinook	Summer chum	Fall chum	Coho	Set gillnet	Drift gillnet	Fish wheels	Other
<i>Included in the communities above:</i>										
Survey community subtotal	225	2,302	783	735	129	116	164	46	0	15
Subsistence permit subtotal	49	875	387	19	18	55	41	0	3	5
Test fishery subtotal	ND	ND	825	512	558	125	ND	ND	ND	ND
District 6 commercial retained ^k	ND	ND	0	0	0	0	ND	ND	ND	ND
Personal Use permit total	2	69	0	0	0	0	0	0	0	2
Subsistence harvests total	274	3,177	1,995	1,266	705	296	205	46	3	20

Note: Source: Padilla et al. *In prep* (data preliminary until published). En dashes indicate data are not available due to confidentiality. ND indicates no data.

^a Primary gear is the gear type used to harvest the largest number of salmon by each household. Other gear types included dip nets, fyke nets, jigging, spear, and beach seines. Discrepancies between gear and household totals are due to rounding.

^b Does not include 266 households that fished with a Tolovana River northern pike permit and did not harvest salmon, or 3 households that fished in more than 1 permit area.

^c Included District 3 survey communities combined to preserve confidentiality.

^d Included District 4 survey communities combined to preserve confidentiality.

^e Includes salmon distributed from test fishery projects (added to survey estimates).

^f Community of Rampart permit data included as it was historically a survey community.

^g Permit data from permits returned by April 1, 2022.

^h Fairbanks (FNSB) North Star Borough includes Fairbanks, Ester, North Pole, Salcha, and Two Rivers.

ⁱ Other District 5 included residents of Anchorage, Douglas, Eagle River, Manley Hot Springs, and Wasilla that fished in a Yukon River required permit area.

^j Other District 6 included residents of Anchorage, Delta Junction, Fairbanks (FNSB), Lake Minchumina, Tok, and Wasilla who obtained a permit and fished in the Tanana River.

^k Number of salmon retained from commercial fisheries and used for subsistence in District 6. These salmon were added to permit harvest totals from District 6 communities.

Table 6.—Summary of 2021 salmon escapement counts compared to existing goals.

Stock/Location	Assessment method	Goal type	Goals	2020 escapement
Chinook salmon stock				
East Fork Andreafsky	Weir	SEG	2,100–4,900	1,418
West Fork Andreafsky	Aerial survey	SEG	640–1,600	Not conducted
Anvik (drainagewide)	Aerial survey	SEG	1,100–1,700	Not conducted
Nulato (forks combined)	Aerial survey	SEG	940–1900	Not conducted
Gisasa	Weir	none	—	Not operated
Henshaw	Weir	none	—	130
Chena	Tower/Sonar	BEG	2,800–5,700	1,417
Salcha	Tower/Sonar	BEG	3,300–6,500	2,082
Canada (upper Yukon River)	Sonar-harvest	IMEG	42,500–55,000	31,452
Summer chum salmon stock				
Yukon drainagewide	Sonar	BEG	500,000–1,200,000	153,000 ^a
E. Fork Andreafsky	Weir	BEG	>40,000	2,531
Anvik	Sonar	BEG	350,000–700,000	18,819
Gisasa	Weir	none	—	Not operated
Henshaw	Weir	none	—	3,729
Chena	Tower/sonar	none	—	578 ^b
Salcha	Tower/sonar	none	—	2,193 ^b
Fall chum salmon stock				
Yukon drainagewide	Sonar and harvest	SEG	300,000–600,000	94,500 ^c
Teedriinjik River	Sonar	SEG	85,000–234,000	21,162
Delta River	Ground surveys	SEG	7,000–20,000	1,600 ^c
Fishing Branch	Weir/sonar	IMEG	22,000–49,000	2,413
Canada (upper Yukon River)	Sonar-harvest	IMEG	70,000–104,000	23,170
Porcupine River (Canada Portion)	Sonar-harvest	none	—	3,486
Coho salmon stock				
Delta Clearwater River	Boat survey	SEG	5,200–17,000	913

Note: Biological escapement goal (BEG), sustainable escapement goal (SEG) and interim management escapement goal (IMEG). En dashes indicate no data.

^a Total escapement could not be determined. Sonar only operated 17 days due to flooding and debris.

^b Drainagewide escapement based on the Pilot Station sonar and estimate of escapement to the Andreafsky River drainage minus harvest estimates above the sonar site.

^c Numbers are rounded.

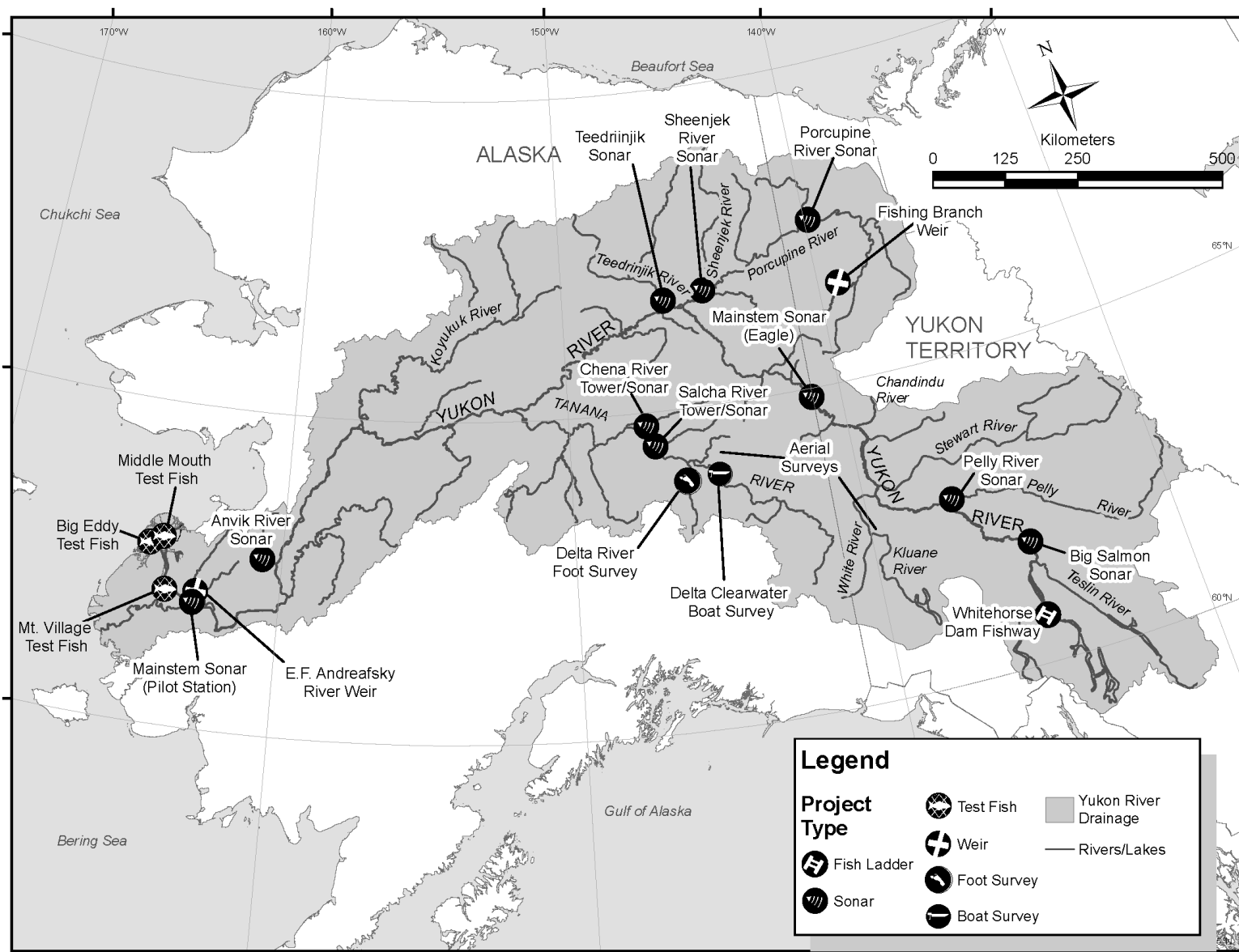


Figure 1.—Map of the Yukon River drainage showing select salmon monitoring projects. Does not show aerial surveys, 2021.

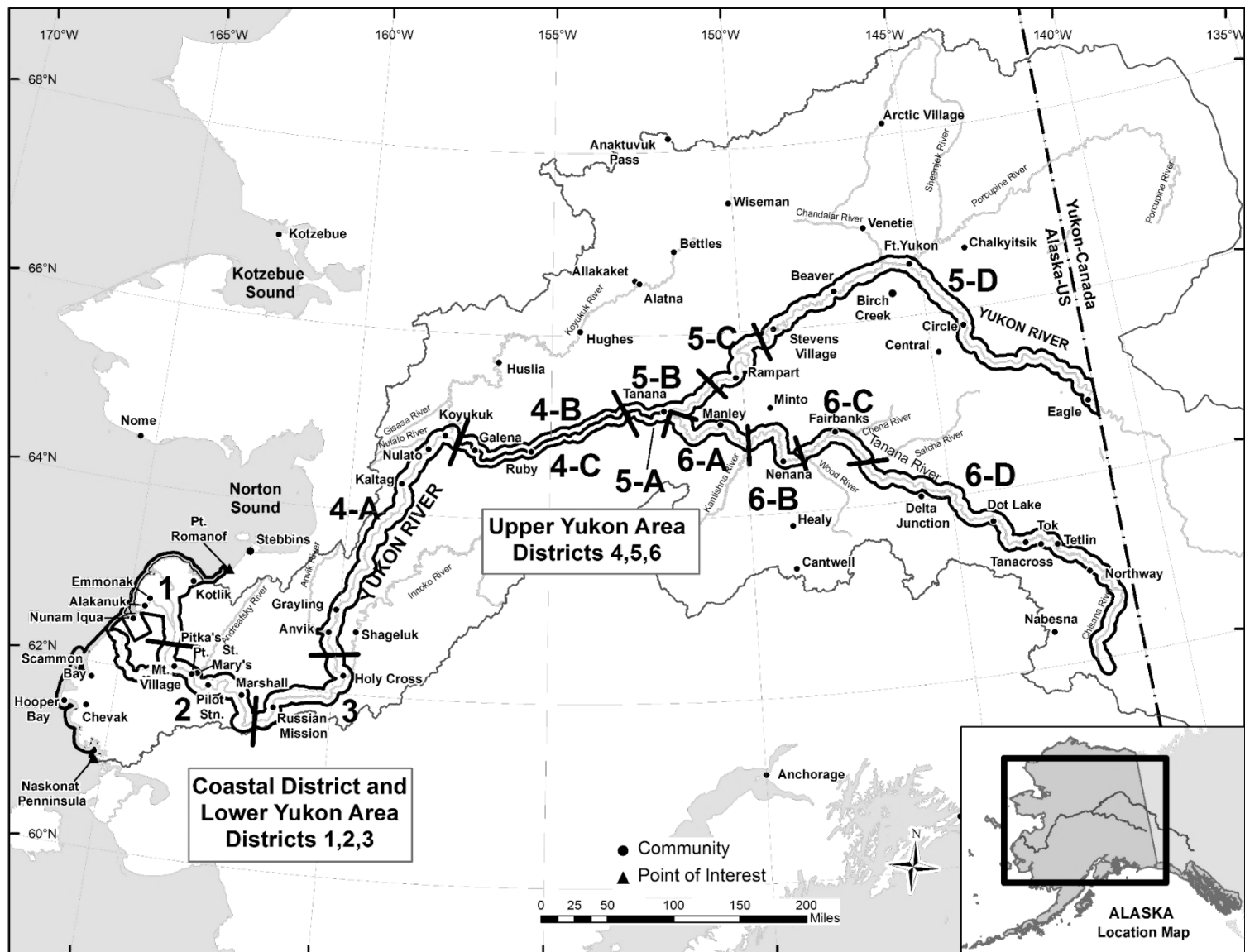


Figure 2.—Map of the Alaska portion of the Yukon River drainage showing communities and fishing districts, 2021.

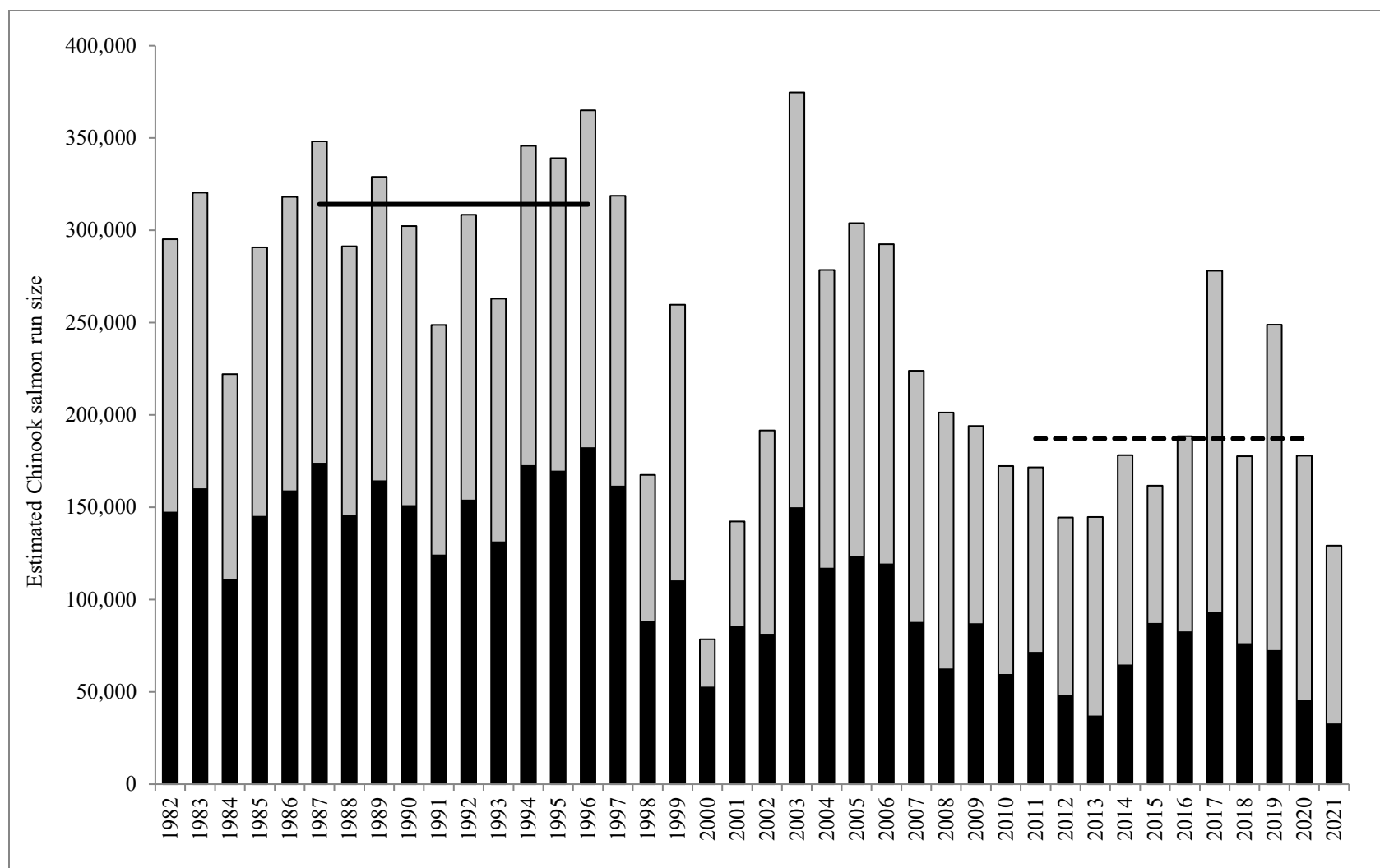


Figure 3.—Historical estimated Yukon River Chinook salmon drainagewide and Canada-origin run size, various methods, 1982 to 2021.

Note: Gray bars are drainagewide total run, black bars are Canada-origin run size. For years 1982–1994 and 1996, the Canada-origin run size is doubled to calculate drainagewide run size. Run size for 1995 and 1997–2020 is calculated using Pilot Station sonar passage plus escapement and harvest below the sonar. The solid black line is the 1987–1996 average run size. The dashed line is the recent 10-year average run size (2011–2020).

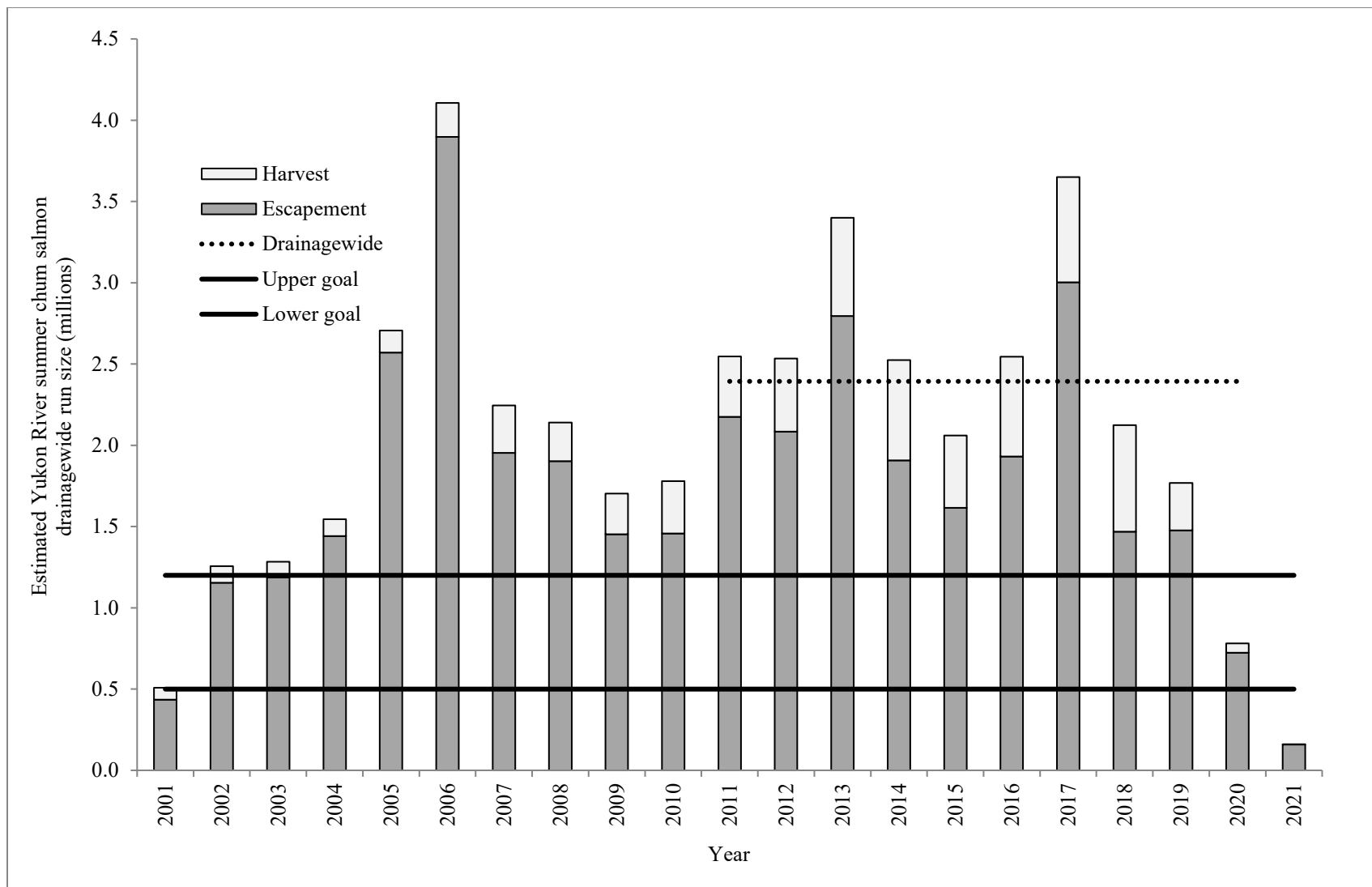


Figure 4.—Estimated Yukon River summer chum drainagewide run size, 2001–2021.

Note: Dashed line is 2011–2020 average drainagewide run size. Solid line is upper and lower end of drainagewide escapement goal. Drainagewide run is the sum of harvest below Pilot Station sonar, East Fork Andreafsky weir count doubled, and the Pilot Station sonar count.

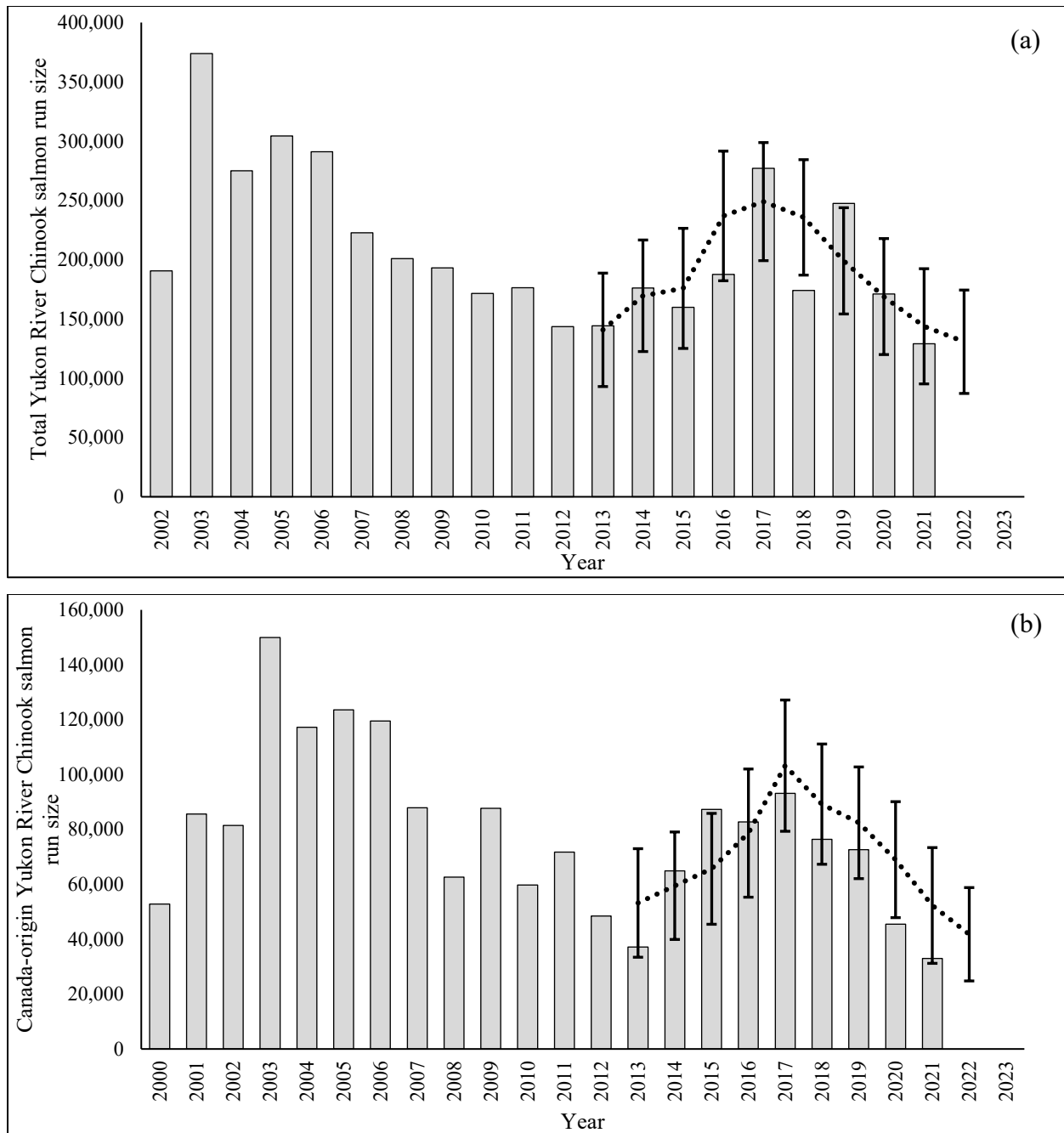


Figure 5.—Run sizes of drainagewide (a) and Canada-origin (b) Yukon River Chinook salmon.

Note: Different scales on the y axes of each panel. Error bars reflect the 80% prediction interval around the juvenile-based forecasted abundance of run size. Grey bars represent the post-season estimated run size. No forecast due to suspended juvenile survey in 2020.

APPENDIX A: SUMMARIES OF THE 2021 SEASON

Appendix A1.—Salmon fishery projects conducted in the Alaska portion of the Yukon River drainage in 2021.

Project name	Location and river mile (RM)	Primary objective(s)	Duration	Agency	Responsibility
Anvik River sonar ^a	Anvik River (RM 40), Yukon River (RM 358)	(1) Estimate daily escapement of summer chum salmon to the Anvik River; and (2) estimate age, sex, and size composition of the summer chum salmon escapement.	Jun–Jul	ADF&G	All aspects AKSSF Funding
Chena River tower	Chena River (RM 45), Tanana River (RM 921)	Estimate daily escapement of Chinook and summer chum salmon into the Chena River.	Jul–Aug	ADF&G	All aspects AKSSF Funding
Delta River ground surveys	Tanana River drainage (RM 1,031)	(1) Estimate fall chum salmon spawning escapement in Delta River; and (2) sample fall chum salmon carcasses for age, sex, and size composition information.	Oct–Dec	ADF&G	All aspects
East Fork weir, Andreafsky River	East Fork Andreafsky River (RM 20), Yukon River (RM 124)	Estimate daily escapement, with age, sex and size composition, of Chinook and summer chum salmon into the East Fork of the Andreafsky River.	Jun–Aug	USFWS	All aspects OSM Funding
Henshaw Creek weir	Henshaw Creek (RM 1), Koyukuk River (RM 976)	(1) Estimate daily escapement of Chinook and summer chum salmon into Henshaw Creek; and (2) estimate age, sex, and size composition of the Chinook and summer chum salmon escapements.	Jun–Aug	TCC, USFWS- OSM	All aspects oversight & funding report write-up
Inriver coded-wire tag (CWT) recovery (Whitehorse hatchery tags)	Yukon River drainage	Collection of Chinook salmon heads from all operating projects that are marked with no adipose fin and sent to lab to extract data tag.	May–Sep	ADF&G	Decoding
Lower Yukon River drift gillnet test fishing	South and Middle mouths of the Yukon River Delta (RM 20)	(1) Index Chinook, summer and fall chum, and coho salmon run timing and abundance using drift gillnets; and (2) sample captured salmon for age, sex, size composition information.	Jun–Aug	ADF&G, YDFDA	All aspects
Lower Yukon River set gillnet test fishing	South, Middle, and North mouths of the Yukon River Delta (RM 20)	(1) Index Chinook salmon run timing and abundance using set gillnets; and (2) sample captured salmon for age, sex, size composition information.	Jun–Aug	ADF&G, YDFDA	All aspects
Mountain Village drift gillnet test fishing	Mainstem Yukon River (RM 87)	(1) Index fall chum and coho salmon run timing and relative abundance using drift gillnets; and (2) sample captured salmon for age, sex, size composition information.	Jul–Sep	Sandone Consulting LLC, ATC, ADF&G	All aspects R&M funding

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Project name	Location and river mile (RM)	Primary objective(s)	Duration	Agency	Responsibility
Salcha River tower ^a	Salcha River (RM 4), Tanana River (RM 967)	Estimate daily escapement of Chinook and summer chum salmon into the Salcha River.	Jul–Aug	ADF&G	All aspects AKSSF Funding
Sex ID study	Emmonak	Examination of accuracy of visual identification of sex of Chinook, chum, and coho salmon.	Jun–Aug	ADF&G	All aspects
Teedriinjik River sonar	Teedriinjik River (RM 14), Yukon River (RM 996)	Estimate fall chum salmon passage using DIDSON sonars in the Teedriinjik River.	Aug–Sep	USFWS	All aspects TI Funding
Upper Tanana escapement surveys	Tanana River drainage (RM 991–1,053)	Boat survey for number and distribution of coho salmon in a tributary of the Tanana River drainage.	Oct	ADF&G	All aspects
YRDFA weekly teleconferences	Yukon River drainage	Acts as a forum for fishers along the Yukon River to interact with state and federal managers for the collection and dissemination of fisheries information.	May–Sep	YRDFA	All aspects OSM Funding
Yukon River Chinook salmon genetic baseline improvements	Yukon River drainage	Develop improved Yukon River Chinook salmon genetic baseline using additional populations in US and Canada and new genotyping and baseline evaluation methods.	Jun–Aug	ADF&G, DFO	All aspects
Yukon River chum salmon stock identification	Yukon River drainage	Estimate chum salmon stock composition using genetic stock identification from the Yukon River mainstem sonar project in the lower river (RM 123).	Jun–Sep	USFWS	All aspects
Yukon River inseason salmon harvest interviews	Alakanuk, Marshall, Russian Mission, Holy Cross, Kaltag, Huslia, Galena, Nenana, Ft. Yukon, and Eagle	Collect qualitative inseason subsistence salmon harvest information through weekly interviews.	May–Aug	YRDFA, USFWS	All aspects OSM funding
Yukon River sonar	Pilot Station (RM 123)	Estimate Chinook and summer and fall chum salmon passage in the mainstem Yukon River using a combination of sonar and gillnetting. Apportionment of species includes coho salmon and other finfish.	May–Sep	ADF&G	All aspects
Yukon River sonar	Eagle (RM 1,213)	(1) Estimate daily passage of Chinook and chum salmon in the mainstem Yukon River using both split-beam and DIDSON; and (2) estimate age, sex, and size composition of salmon captured in the test nets.	Jul–Oct	ADF&G, DFO	All aspects technical support, TI Funding, ADF&G GF

-continued-

^a Did not operate due to COVID-19 pandemic, budget cuts, or weather.

Acronyms:

ADF&G = Alaska Department of Fish and Game

ADPS = Alaska Department of Public Safety

AFSC = Alaska Fisheries Science Center

ATC = Asa'carsarmiut Tribal Council

AVCP = Association of Village Council Presidents, Inc.

AKSSF = Alaska Sustainable Salmon Fund

BSFA = Bering Sea Fishermen's Association

DFO = Department of Fisheries and Oceans (Canada)

DNA = Deoxyribonucleic acid

NOAA = National Oceanic and Atmospheric Administration

OSM = Office of Subsistence Management

R&E = Restoration and Enhancement Fund

R&M = Research and Management Fund

TCC = Tanana Chiefs Conference, Inc.

USFWS = United States Fish and Wildlife Service

USFWS-OSM = United States Fish and Wildlife Service, Office of Subsistence Management

YDFDA = Yukon Delta Fisheries Development Association

YRDFA = Yukon River Drainage Fisheries Association

Appendix A2.—List of harvest/escapement monitoring and incubation/rearing projects involving salmon in the Canada portion of the Yukon River drainage in 2021.

Project name	Location	Primary objective(s)	Duration	Agency	Responsibility
Big Salmon sonar	Big Salmon River	(1) Installation and operation of a sonar program for Chinook salmon, and (2) obtain carcass ASL samples.	Jul–Aug	Metla Env. Inc., JW&A	All aspects
Deadman Creek Chinook salmon restoration project	Deadman Creek	(1) Continue efforts to restore an extirpated population of Chinook salmon in Deadman Creek through egg planting; (2) assess presence of juvenile Chinook from past years' plantings, and (3) conduct carcass surveys for post-spawn returning adult Chinook	May–Sep	Teslin Tlingit Council & EDI	All aspects
Escapement surveys and biological sampling	Throughout upper Yukon River drainage	(1) To conduct surveys of spawning fish by foot, boat, air etc., and (2) collect ASL and genetic tissue samples from spawning populations.	Jul–Oct	R&E Projects, DFO, YFNs, AFS	All aspects
First nation subsistence catch monitoring	Yukon communities	(1) To determine harvest in the First Nation subsistence fishery, and (2) implement components of the UFA and AFS.	Jul–Oct	YFNs, DFO	Joint Project
Fishing branch river weir & video counter	Fishing Branch River	(1) Installation and operation of a weir and video counting system to estimate passage of chum salmon, and (2) ASL sample collection from chum salmon	Aug–Oct	Vuntut Gwitchin, DFO	All aspects
Fox Creek Chinook salmon restoration project	Fox Creek	(1) Continue efforts to restore an extirpated population of Chinook salmon in Fox Creek, and (2) assess upstream passage of returning adult Chinook salmon using a weir and video counting system	May–Sep	Ta'an Kwäch'än Council	All aspects
Impacts to the Kluane Fall chum salmon stock from a major hydrological change	Kluane Lake and River	(1) Describe baseline and current habitat use of spawning and incubating chum salmon, (2) assess suitability of habitat given recent reduction in flow, and (3) project likely impact of changes.	Sept–Mar	DFO	All aspects
Klondike River sonar	Klondike River at junction with Yukon mainstem	(1) Develop an accurate, inseason stock assessment tool to estimate the annual passage rates for Chinook salmon in the Klondike River	Jul–Aug	Tr'ondëk Hwëch'in & EDI	All aspects
Pelly River sonar	Pelly River mainstem	(1) Develop an accurate, inseason stock assessment tool to estimate the annual passage rates for Chinook salmon in the Pelly River, and (2) conduct test netting for species apportionment, and to collect ASL samples.	Jul–Aug	Selkirk First Nation & EDI	All aspects

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Project name	Location	Primary objective(s)	Duration	Agency	Responsibility
Public angling catch monitoring	Yukon River mainstem and tributaries	(1) To determine the public angling harvest by species including the date, sex, whether released or retained, and fishing location, and (2) report caught salmon through the YSCCC program.	Jul–Oct	DFO	All aspects
Porcupine River sonar	Old Crow	(1) Installation and operation of 2 ARIS sonars to estimate Chinook and fall chum salmon daily passage, and (2) conduct biological sampling for species apportionment, age, sex, length, and genetics.	Aug–Oct	Vuntut Gwitchin, DFO	All aspects
Whitehorse Rapids fishway	Whitehorse	(1) To enumerate wild and hatchery-reared Chinook salmon returns to the Whitehorse fishway area; and (2) obtain age, size, sex, and tag data.	Jul–Aug	YF&GA	All aspects
Whitehorse Rapids fish hatchery and coded-wire tagging project	Whitehorse	(1) To rear and release ~150K Chinook salmon fry produced from Whitehorse Rapids Fishway broodstock, and (2) mark fry with a CWT, adipose clip, and release upstream of the Whitehorse hydroelectric facility.	Ongoing	GY and YEC, YF&GA, DFO	All aspects coded-wire tagging

Note: Acronyms:

ASL = Age Sex Length–term that refers to the collection of biological information.

AFS = Aboriginal Fisheries Strategy

CWT = coded wire tag

DFO = Department of Fisheries and Oceans Canada

DNA = Deoxyribonucleic acid

EDI = Environmental Dynamics Incorporated

GY = Government of Yukon-Environment Yukon

JW&A = Jane Wilson & Associates

Metla Env. Inc = Metla Environmental Incorporated

UFA = Umbrella Final Agreement

YEC = Yukon Energy Corporation

YFNs = Yukon First Nations

YF&GA = Yukon Fish and Game Association

YSCCC = Yukon Salmon Conservation Catch Card

Appendix A3.–Daily and cumulative CPUE for Chinook salmon in the set gillnet test fishery at Big Eddy, lower Yukon River, 2021.

Chinook salmon in set gillnets				
Date	Daily catch ^a	Daily CPUE	Proportion	Cumulative CPUE
6/4	11	0.46	0.02	0.46
6/5	31	1.29	0.06	1.75
6/6	75	3.13	0.16	4.88
6/7	35	1.46	0.21	6.33
6/8	11	0.46	0.23	6.79
6/9	15	0.63	0.25	7.42
6/10	16	0.67	0.27	8.08
6/11	28	1.17	0.31	9.25
6/12	20	0.83	0.34	10.08
6/13	11	0.46	0.35	10.54
6/14	7	0.58	0.37	11.12
6/15	34	0.94 ^a	0.40	12.07
6/16	7	0.29	0.41	12.36
6/17	2	0.08	0.42	12.44
6/18	17	0.71	0.44	13.15
6/19	5	0.21	0.45	13.36
6/20	3	0.13	0.45	13.48
6/21	31	1.29	0.50	14.78
6/22	10	0.42	0.51	15.19
6/23	10	0.42	0.52	15.61
6/24	46	1.92	0.59	17.53
6/25	20	0.83	0.62	18.36
6/26	23	0.96	0.65	19.32
6/27	31	1.29	0.69	20.61
6/28	39	1.63	0.75	22.24
6/29	15	0.63	0.77	22.86
6/30	51	2.13	0.84	24.99
7/1	15	0.63	0.86	25.61
7/2	6	0.25	0.87	25.86
7/3	10	0.42	0.88	26.28
7/4	23	0.96	0.91	27.24
7/5	20	0.83	0.94	28.07
7/6	4	0.17	0.95	28.24
7/7	1	0.04	0.95	28.28
7/8	16	0.67	0.97	28.94
7/9	9	0.38	0.98	29.32
7/10	9	0.38	1.00	29.69
7/11	3	0.13	1.00	29.82
7/12	0	0.00	1.00	29.82
Total	720	29.82	NA	29.82

Note: The box within the cumulative CPUE column indicates the first quarter point, midpoint, and third quarter point of the cumulative index.

^a Afternoon setnet check canceled. Count is from a 22-hour soak time.

Appendix A4.–Daily and cumulative CPUE for Chinook salmon in the cooperative 8.25-inch mesh drift gillnet test fishery, Big Eddy and Middle Mouth sites combined, lower Yukon River, 2021.

Chinook salmon in 8.25" drift gillnet												
Date	Big Eddy drift				Middle Mouth drift				Big Eddy and Middle Mouth combined			
	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE
5/22	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/23	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/24	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/25	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/26	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/27	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/28	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/29	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/30	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
5/31	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
6/1	0	0.00	0.00	0.00	–	–	–	–	0	0.00	0.00	0.00
6/2	3	4.19	0.10	4.19	–	–	–	–	3	4.19	0.06	4.19
6/3	2	3.16	0.18	7.34	–	–	–	–	2	3.16	0.11	7.34
6/4	5	7.90	0.36	15.24	–	–	–	–	5	7.90	0.23	15.24
6/5	3 ^a	6.15	0.51	21.39	0	0.00	0.00	0.00	3	2.64	0.28	17.88
6/6	4	6.32	0.66	27.71	0	0.00	0.00	0.00	4	3.16	0.32	21.03
6/7	0	0.00	0.66	27.71	0	0.00	0.00	0.00	0	0.00	0.32	21.03
6/8	0	0.00	0.66	27.71	0	0.00	0.00	0.00	0	0.00	0.32	21.03
6/9	0	0.00	0.66	27.71	0	0.00	0.00	0.00	0	0.00	0.32	21.03
6/10	0	0.00	0.66	27.71	1	1.61	0.02	1.61	1	0.80	0.34	21.83
6/11	1	1.58	0.70	29.29	0	0.00	0.02	1.61	1	0.79	0.35	22.62
6/12	1	1.58	0.74	30.87	0	0.00	0.02	1.61	1	0.78	0.36	23.41
6/13	0	0.00	0.74	30.87	0	0.00	0.02	1.61	0	0.00	0.36	23.41
6/14	0 ^b	0.00	0.74	30.87	0	0.00	0.02	1.61	0	0.00	0.36	23.41
6/15	0	0.00	0.74	30.87	2	3.14	0.07	4.75	2	1.57	0.38	24.98
6/16	0	0.00	0.74	30.87	7	10.84	0.21	15.59	7	5.47	0.47	30.45
6/17	0 ^c	0.00	0.74	30.87	0	0.00	0.21	15.59	0	0.00	0.47	30.45
6/18	1	1.58	0.77	32.45	3	4.74	0.28	20.32	4	3.16	0.52	33.61
6/19	0	0.00	0.77	32.45	0	0.00	0.28	20.32	0	0.00	0.52	33.61

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Chinook salmon in 8.25" drift gillnet												
Date	Big Eddy drift				Middle Mouth drift				Big Eddy and Middle Mouth combined			
	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE
6/20	0	0.00	0.77	32.45	0	0.00	0.28	20.32	0	0.00	0.52	33.61
6/21	0	0.00	0.77	32.45	0	0.00	0.28	20.32	0	0.00	0.52	33.61
6/22	1	1.58	0.81	34.03	0	0.00	0.28	20.32	1	0.79	0.53	34.40
6/23	0	0.00	0.81	34.03	0 ^d	0.00	0.28	20.32	0	0.00	0.53	34.40
6/24	2	3.16	0.89	37.18	1	1.58	0.30	21.90	3	2.37	0.57	36.76
6/25	0	0.00	0.89	37.18	0	0.00	0.30	21.90	0	0.00	0.57	36.76
6/26	0	0.00	0.89	37.18	0	0.00	0.30	21.90	0	0.00	0.57	36.76
6/27	0	0.00	0.89	37.18	2	3.16	0.34	25.06	2	1.58	0.59	38.34
6/28	0	0.00	0.89	37.18	10	15.00	0.55	40.06	10	7.69	0.71	46.04
6/29	0	0.00	0.89	37.18	2	3.14	0.59	43.20	2	1.54	0.73	47.58
6/30	3	4.74	1.00	41.92	2	3.18	0.64	46.38	5	3.96	0.79	51.54
7/1	0	0.00	1.00	41.92	0	0.00	0.64	46.38	0	0.00	0.79	51.54
7/2	0	0.00	1.00	41.92	1	1.58	0.66	47.96	1	0.77	0.81	52.31
7/3	0	0.00	1.00	41.92	1	1.58	0.68	49.54	1	0.79	0.82	53.10
7/4	0 ^d	0.00	1.00	41.92	0	0.00	0.68	49.54	0	0.00	0.82	53.10
7/5	0	0.00	1.00	41.92	7	10.84	0.83	60.37	7	5.47	0.90	58.57
7/6	0	0.00	1.00	41.92	3	4.74	0.89	65.11	3	2.37	0.94	60.94
7/7	0 ^d	0.00	1.00	41.92	0	0.00	0.89	65.11	0	0.00	0.94	60.94
7/8	0	0.00	1.00	41.92	3	4.74	0.96	69.85	3	2.37	0.98	63.31
7/9	0	0.00	1.00	41.92	0	0.00	0.96	69.85	0	0.00	0.98	63.31
7/10	0	0.00	1.00	41.92	0	0.00	0.96	69.85	0	0.00	0.98	63.31
7/11	0	0.00	1.00	41.92	2	3.16	1.00	73.01	2	1.58	1.00	64.89
7/12	0	0.00	1.00	41.92	0	0.00	1.00	73.01	0	0.00	1.00	64.89
7/13	0	0.00	1.00	41.92	0	0.00	1.00	73.01	0	0.00	1.00	64.89
7/14	0	0.00	1.00	41.92	0	0.00	1.00	73.01	0	0.00	1.00	64.89
7/15	0	0.00	1.00	41.92	0	0.00	1.00	73.01	0	0.00	1.00	64.89
Total	26			41.92	47			73.01	73			64.89

Note: En dashes indicate no data.

^a Evening site 1 drift canceled due to strong winds.

^b Evening drifts canceled due to inclement weather.

^c Morning drift canceled due to heavy fog.

^d Evening site 2 drift canceled due to waves.

Appendix A5.—Daily and cumulative CPUE for summer chum salmon in the cooperative 5.5-inch mesh drift gillnet test fishery, Big Eddy and Middle Mouth sites combined, lower Yukon River, 2021.

Summer chum salmon in 5.5" drift gillnet												
Big Eddy drift					Middle Mouth drift				Big Eddy and Middle Mouth combined			
Date	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE
5/25	0	0.00	0.00	0.00	—	—	—	—	0	0.00	0.00	0.00
5/26	0	0.00	0.00	0.00	—	—	—	—	0	0.00	0.00	0.00
5/27	0	0.00	0.00	0.00	—	—	—	—	0	0.00	0.00	0.00
5/28	0	0.00	0.00	0.00	—	—	—	—	0	0.00	0.00	0.00
5/29	0	0.00	0.00	0.00	—	—	—	—	0	0.00	0.00	0.00
5/30	1	1.56	0.01	1.56	—	—	—	—	1	1.56	0.01	1.56
5/31	3	4.74	0.04	6.30	—	—	—	—	3	4.74	0.03	6.30
6/1	2	3.31	0.05	9.61	—	—	—	—	2	3.31	0.05	9.61
6/2	0	0.00	0.05	9.61	—	—	—	—	0	0.00	0.05	9.61
6/3	1	1.58	0.06	11.18	—	—	—	—	1	1.58	0.06	11.18
6/4	7	10.98	0.12	22.16	—	—	—	—	7	10.98	0.12	22.16
6/5	5 ^a	10.62	0.18	32.78	0	0.00	0.00	0.00	5	4.53	0.14	26.69
6/6	0	0.00	0.18	32.78	0	0.00	0.00	0.00	0	0.00	0.14	26.69
6/7	1	1.71	0.19	34.50	0	0.00	0.00	0.00	1	0.83	0.14	27.52
6/8	1	1.71	0.20	36.21	0	0.00	0.00	0.00	1	0.85	0.15	28.37
6/9	0	0.00	0.20	36.21	0	0.00	0.00	0.00	0	0.00	0.15	28.37
6/10	1	1.54	0.21	37.75	0	0.00	0.00	0.00	1	0.79	0.15	29.16
6/11	0	0.00	0.21	37.75	0	0.00	0.00	0.00	0	0.00	0.15	29.16
6/12	8	9.85	0.27	47.60	1	1.58	0.01	1.58	9	6.23	0.18	35.38
6/13	0	0.00	0.27	47.60	0	0.00	0.01	1.58	0	0.00	0.18	35.38
6/14	0 ^b	0.00	0.27	47.60	0 ^b	0.00	0.01	1.58	0	0.00	0.18	35.38
6/15	0	0.00	0.27	47.60	4	6.32	0.04	7.90	4	3.16	0.20	38.54
6/16	0	0.00	0.27	47.60	3	4.71	0.07	12.60	3	2.36	0.21	40.90
6/17	0 ^c	0.00	0.27	47.60	1	1.58	0.08	14.18	1	1.05	0.22	41.95
6/18	3	4.74	0.29	52.33	1	1.29	0.09	15.47	4	2.84	0.23	44.79
6/19	0	0.00	0.29	52.33	1	1.59	0.09	17.06	1	0.78	0.24	45.57
6/20	0	0.00	0.29	52.33	0	0.00	0.09	17.06	0	0.00	0.24	45.57
6/21	13	20.13	0.41	72.46	0	0.00	0.09	17.06	13	10.10	0.29	55.67
6/22	0	0.00	0.41	72.46	1	1.56	0.10	18.62	1	0.78	0.29	56.45

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Summer chum salmon in 5.5" drift gillnet												
Date	Big Eddy drift				Middle Mouth drift				Big Eddy and Middle Mouth combined			
	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE
6/23	1	1.57	0.42	74.03	0 ^d	0.00	0.10	18.62	1	0.89	0.30	57.34
6/24	3	4.74	0.44	78.77	0	0.00	0.10	18.62	3	2.37	0.31	59.71
6/25	0	0.00	0.44	78.77	0	0.00	0.10	18.62	0	0.00	0.31	59.71
6/26	1	1.57	0.45	80.34	1	1.58	0.11	20.20	2	1.57	0.32	61.28
6/27	3	4.74	0.48	85.07	8	12.63	0.18	32.83	11	8.68	0.36	69.97
6/28	43	67.45	0.86	152.52	8	12.80	0.25	45.63	51	40.40	0.58	110.36
6/29	4	6.32	0.89	158.84	2	3.10	0.27	48.73	6	4.69	0.60	115.05
6/30	8	12.97	0.96	171.81	2 ^c	6.32	0.30	55.04	10	10.71	0.66	125.77
7/1	1	1.58	0.97	173.39	0	0.00	0.30	55.04	1	0.80	0.66	126.56
7/2	0	0.00	0.97	173.39	1	1.59	0.31	56.63	1	0.79	0.66	127.36
7/3	0	0.00	0.97	173.39	0	0.00	0.31	56.63	0	0.00	0.66	127.36
7/4	2	3.16	0.99	176.55	26	39.49	0.53	96.12	28	21.68	0.78	149.03
7/5	0	0.00	0.99	176.55	19	29.61	0.69	125.73	19	15.20	0.86	164.23
7/6	0	0.00	0.99	176.55	1	1.56	0.70	127.29	1	0.80	0.86	165.03
7/7	0	0.00	0.99	176.55	1	1.60	0.71	128.89	1	0.86	0.86	165.89
7/8	1	1.50	1.00	178.05	12	18.95	0.81	147.84	13	10.00	0.92	175.89
7/9	0	0.00	1.00	178.05	4 ^d	8.35	0.86	156.19	4	3.54	0.94	179.43
7/10	0	0.00	1.00	178.05	11	17.37	0.96	173.56	11	8.57	0.98	188.00
7/11	0	0.00	1.00	178.05	0	0.00	0.96	173.56	0	0.00	0.98	188.00
7/12	0	0.00	1.00	178.05	2	3.16	0.97	176.71	2	1.56	0.99	189.56
7/13	0	0.00	1.00	178.05	2	3.16	0.99	179.87	2	1.56	1.00	191.12
7/14	0	0.00	1.00	178.05	0	0.00	0.99	179.87	0	0.00	1.00	191.12
7/15	0	0.00	1.00	178.05	1	1.59	1.00	181.46	1	0.78	1.00	191.90
Total	113			178.05	113			181.46	226			191.90

Note: En dashes indicate no data.

^a Evening site 1 drift canceled due to weather.

^b Evening drifts canceled due to weather.

^c Morning drift canceled due to weather or mechanical issues.

^d Evening site 2 canceled due to weather.

Appendix A6.–Fall chum and coho salmon daily and cumulative CPUE in the cooperative drift gillnet (6") test fishery, Big Eddy and Middle Mouth sites combined, lower Yukon management area, 2001 to 2020 compared to 2021.

Date	Fall chum salmon							Coho salmon						
	Historical (2001–2020) average			2021				Historical (2001–2020) average			2021			
	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE
7/16	26.99	0.02	26.99	17	13.04	0.10	13.04	0.00	0.00	0.00	0	0.00	0.00	0.00
7/17	33.54	0.04	60.53	2	1.58	0.12	14.61	0.04	0.00	0.04	0	0.00	0.00	0.00
7/18	39.50	0.06	100.03	4	3.07	0.14	17.68	0.04	0.00	0.07	0	0.00	0.00	0.00
7/19	32.50	0.08	132.54	2	1.57	0.15	19.26	0.04	0.00	0.11	0	0.00	0.00	0.00
7/20	17.19	0.09	149.72	0	0.00 ^a	0.15	19.26	0.00	0.00	0.11	0	0.00 ^a	0.00	0.00
7/21	12.57	0.10	162.29	0	0.00 ^a	0.15	19.26	0.08	0.00	0.19	0	0.00 ^a	0.00	0.00
7/22	16.62	0.11	178.91	0	0.00	0.15	19.26	0.04	0.00	0.22	0	0.00	0.00	0.00
7/23	15.64	0.12	194.55	4	3.14	0.18	22.39	0.20	0.00	0.42	0	0.00	0.00	0.00
7/24	17.19	0.13	211.74	0	0.00	0.18	22.39	0.20	0.00	0.63	0	0.00	0.00	0.00
7/25	13.21	0.14	224.95	1	0.80	0.18	23.19	0.19	0.00	0.81	0	0.00	0.00	0.00
7/26	17.24	0.15	242.19	0	0.00 ^a	0.18	23.19	0.27	0.00	1.08	0	0.00 ^a	0.00	0.00
7/27	23.33	0.16	265.52	ND	5.24 ^b	0.23	28.43	0.72	0.00	1.81	ND	0.00 ^b	0.00	0.00
7/28	27.62	0.18	293.15	ND	6.55 ^b	0.28	34.98	0.89	0.01	2.70	ND	0.00 ^b	0.00	0.00
7/29	33.85	0.21	327.00	14	10.00	0.36	44.98	1.30	0.01	4.00	0	0.00	0.00	0.00
7/30	28.66	0.23	355.66	2	1.58	0.37	46.56	1.75	0.02	5.75	0	0.00	0.00	0.00
7/31	38.20	0.25	393.86	ND	0.79 ^b	0.38	47.35	1.09	0.02	6.84	ND	0.00 ^b	0.00	0.00
8/1	43.77	0.28	437.63	0	0.00 ^a	0.38	47.35	2.38	0.03	9.22	0	0.00 ^a	0.00	0.00
8/2	35.76	0.31	473.39	0	0.00 ^a	0.38	47.35	2.92	0.03	12.14	0	0.00 ^a	0.00	0.00
8/3	28.08	0.33	501.47	1	0.78	0.38	48.13	6.18	0.05	18.32	0	0.00	0.00	0.00
8/4	28.03	0.35	529.50	0	0.00	0.38	48.13	4.87	0.05	23.20	0	0.00	0.00	0.00
8/5	31.28	0.37	560.78	0	0.00 ^a	0.38	48.13	3.67	0.06	26.87	0	0.00 ^a	0.00	0.00
8/6	42.66	0.40	603.44	3	2.32	0.40	50.44	5.39	0.08	32.26	0	0.00	0.00	0.00
8/7	34.91	0.42	638.35	2	1.53	0.41	51.98	7.93	0.10	40.19	0	0.00	0.00	0.00
8/8	31.72	0.45	670.07	0	0.00	0.41	51.98	8.22	0.13	48.41	0	0.00	0.00	0.00
8/9	24.06	0.47	694.12	0	0.00 ^a	0.41	51.98	6.83	0.15	55.24	0	0.00 ^a	0.00	0.00
8/10	24.83	0.49	718.95	2	1.55	0.43	53.53	10.61	0.17	65.84	2	1.55	0.11	1.55
8/11	20.51	0.50	739.46	2	2.07 ^a	0.44	55.59	8.24	0.19	74.08	0	0.00 ^a	0.11	1.55
8/12	60.21	0.54	799.67	0	0.00	0.44	55.59	13.48	0.22	87.56	0	0.00	0.11	1.55
8/13	79.39	0.58	879.06	3	2.35	0.46	57.95	19.54	0.27	107.10	0	0.00	0.11	1.55
8/14	42.84	0.61	921.90	0	0.00 ^a	0.46	57.95	15.26	0.31	122.36	0	0.00 ^a	0.11	1.55

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Date	Fall chum salmon							Coho salmon						
	Historical (2001–2020) average			2021				Historical (2001–2020) average			2021			
	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE	Daily CPUE	Proportion	Cumulative CPUE	Daily catch	Daily CPUE	Proportion	Cumulative CPUE
8/15	76.07	0.65	997.97	3	3.03 ^a	0.48	60.97	20.84	0.35	143.20	0	0.00 ^a	0.11	1.55
8/16	81.54	0.70	1,079.51	2	4.10 ^a	0.52	65.08	19.88	0.40	163.08	0	0.00 ^a	0.11	1.55
8/17	35.28	0.72	1,114.79	0	0.00	0.52	65.08	17.20	0.44	180.28	0	0.00	0.11	1.55
8/18	54.72	0.75	1,169.52	13	9.94	0.60	75.01	13.24	0.47	193.52	0	0.00	0.11	1.55
8/19	46.00	0.78	1,215.52	0	0.00	0.60	75.01	21.97	0.52	215.49	0	0.00	0.11	1.55
8/20	34.98	0.80	1,250.50	0	0.00	0.60	75.01	23.80	0.58	239.30	1	1.59	0.22	3.14
8/21	32.68	0.82	1,283.18	21	16.15	0.73	91.17	20.39	0.62	259.68	4	3.08	0.44	6.21
8/22	19.33	0.84	1,302.51	11	8.63	0.79	99.79	13.18	0.65	272.86	3	2.35	0.61	8.57
8/23	40.38	0.86	1,342.89	12	9.44	0.87	109.24	13.35	0.69	286.21	2	1.57	0.72	10.14
8/24	24.24	0.88	1,367.13	7	5.44	0.91	114.67	10.99	0.72	297.20	0	0.00	0.72	10.14
8/25	35.99	0.90	1,403.12	0	0.00 ^a	0.91	114.67	14.61	0.75	311.81	0	0.00 ^a	0.72	10.14
8/26	23.69	0.92	1,426.81	ND	0.00 ^b	0.91	114.67	8.50	0.77	320.31	ND	0.00 ^b	0.72	10.14
8/27	44.94	0.94	1,471.75	0	0.00	0.91	114.67	17.28	0.82	337.58	0	0.00	0.72	10.14
8/28	23.03	0.96	1,493.63	0	0.00 ^a	0.91	114.67	8.36	0.84	345.53	0	0.00 ^a	0.72	10.14
8/29	21.89	0.96	1,506.76	0	0.00	0.91	114.67	10.98	0.86	352.12	0	0.00	0.72	10.14
8/30	12.80	0.96	1,513.80	0	0.00	0.91	114.67	15.65	0.88	360.73	0	0.00	0.72	10.14
8/31	21.54	0.97	1,525.65	3	2.37	0.93	117.04	12.98	0.89	367.87	0	0.00	0.72	10.14
9/1	21.63	0.98	1,537.55	2	1.58	0.94	118.62	13.44	0.90	375.26	0	0.00	0.72	10.14
9/2	18.76	0.98	1,547.87	1	0.79	0.95	119.41	11.24	0.92	381.44	1	0.79	0.78	10.93
9/3	17.40	0.98	1,557.44	1	1.05 ^a	0.96	120.46	8.99	0.93	386.38	1	1.05 ^a	0.85	11.98
9/4	7.39	0.99	1,561.50	1	2.11 ^a	0.97	122.57	8.46	0.94	391.03	1	2.11 ^a	1.00	14.09
9/5	8.26	0.99	1,566.05	1	0.79	0.98	123.36	5.89	0.95	394.27	0	0.00	1.00	14.09
9/6	12.18	0.99	1,572.75	0	0.00 ^a	0.98	123.36	9.09	0.96	399.27	0	0.00 ^a	1.00	14.09
9/7	6.89	0.99	1,576.54	0	0.00	0.98	123.36	8.55	0.97	403.97	0	0.00	1.00	14.09
9/8	10.79	1.00	1,582.47	0	0.00	0.98	123.36	8.41	0.98	408.60	0	0.00	1.00	14.09
9/9	7.15	1.00	1,586.41	1	0.79	0.99	124.14	6.51	0.98	412.18	0	0.00	1.00	14.09
9/10	4.46	1.00	1,588.86	1	1.58 ^a	1.00	125.72	4.32	0.99	414.56	0	0.00 ^a	1.00	14.09
Total	NA	NA	NA	139	NA	NA	125.72	NA	NA	NA	15	NA	NA	14.09

Note: The box within the cumulative CPUE column indicates the first quarter point, midpoint, and third quarter point of the cumulative index.

^a Not all drifts were conducted.

^b Data are interpolated

Appendix A7.—List of emergency orders (EO) and their descriptions for Districts 1–6 in the Chinook and summer chum salmon fishery, Yukon management area, 2021.

EO Number: 3-S-SY-01-21

Effective Date: June 2, 2021

Closes unrestricted subsistence salmon fishing in the Coastal District, District 1, and District 2.

In the Coastal District subsistence salmon fishing will close effective 8:00 PM. Wednesday, June 2.

In District 1, subsistence salmon fishing will close effective 8:00 PM. Wednesday, June 2.

In District 2, subsistence salmon fishing will close effective 8:00 PM Friday, June 4.

EO Number: 3-S-SY-02-21

Effective Date: June 2, 2021

Restricts gillnets of 4-inch or less mesh to 10 fathoms in length during subsistence salmon fishing closures. Emergency order number 3-S-SY-01-21 which closed subsistence salmon fishing remains in effect.

In the Coastal District, effective 8:00 PM Wednesday, June 2, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

In District 1, effective 8:00 PM Wednesday, June 2, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

In District 2, effective 8:00 PM Friday, June 4, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

EO Number: 3-S-SY-03-21

Effective Date: June 7, 2021

Closes unrestricted subsistence salmon fishing in District 3, including the Innoko River.

In District 3, excluding the Innoko River, subsistence salmon fishing will close effective 8:00 PM Monday, June 7.

In the Innoko River, subsistence salmon fishing will close effective 8:00 PM Wednesday, June 9.

EO Number: 3-S-SY-04-21

Effective Date: June 7, 2021

Restricts gillnets of 4-inch or less mesh to 10 fathoms in length during subsistence salmon fishing closures. Emergency order number 3-S-SY-03-21 which closed subsistence salmon fishing remains in effect.

In District 3, excluding the Innoko River, effective 8:00 PM Monday, June 7, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

In the Innoko River, effective 8:00 PM Wednesday, June 9, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

EO Number: 3-S-SY-05-21

Effective Date: June 10, 2021

Closes unrestricted subsistence salmon fishing in the lower and upper portions of Subdistrict 4-A, and in the Koyukuk River, and Anvik Special Management Area.

In the lower portion of Subdistrict 4-A, from $\frac{3}{4}$ of a mile downstream from Old Paradise village upstream to Stink Creek, and the Anvik Special Management Area, subsistence salmon fishing will close effective 8:00 PM Thursday, June 10.

In the upper portion of Subdistrict 4-A, from Stink Creek upstream to the tip of Cone Point, subsistence salmon fishing will close effective 8:00 PM Sunday, June 13.

In the Koyukuk River subsistence salmon fishing will close effective 8:00 PM Monday, June 14.

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EO Number: 3-S-SY-06-21

Effective Date: June 10, 2021

Restricts gillnets of 4-inch or less mesh to 10 fathoms in length during subsistence salmon fishing closures in Subdistrict 4-A and the Koyukuk River. Emergency order number 3-S-SY-05-21 which closed subsistence salmon fishing remains in effect.

In the lower portion of Subdistrict 4-A, from $\frac{3}{4}$ of a mile downstream from Old Paradise village upstream to Stink Creek, and the Anvik Special Management Area, effective 8:00 PM Thursday, June 10, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

In the upper portion of Subdistrict 4-A, from Stink Creek upstream to the tip of Cone Point, effective 8:00 PM Sunday, June 13, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

In the Koyukuk River, effective 8:00 PM Monday, June 14, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

EO Number: 3-S-SY-07-21

Effective Date: June 15, 2021

Closes unrestricted subsistence salmon fishing in Subdistricts 4-B and 4-C.

In Subdistricts 4-B and 4-C, subsistence salmon fishing will close effective 8:00 PM Tuesday, June 15.

EO Number: 3-S-SY-08-21

Effective Date: June 15, 2021

Restricts gillnets of 4-inch or less mesh to 10 fathoms in length during subsistence salmon fishing closures in Subdistricts 4-B and 4-C. Emergency order number 3-S-SY-07-21 which closed subsistence salmon fishing remains in effect.

In Subdistricts 4-B and 4-C, effective 8:00 PM Tuesday, June 15, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

EO Number: 3-S-SY-09-21

Effective Date: June 19, 2021

Closes unrestricted subsistence salmon fishing in Subdistricts 5A, 5-B, and 5-C.

In Subdistricts 5-A, 5-B, and 5-C, subsistence salmon fishing will close effective 8:00 PM Saturday, June 19.

EO Number: 3-S-SY-10-21

Effective Date: June 19, 2021

Restricts gillnets of 4-inch or less mesh to 10 fathoms in length during subsistence salmon fishing closures in Subdistricts 5A, 5-B, and 5-C. Emergency order number 3-S-SY-09-21 which closed subsistence salmon fishing remains in effect.

In Subdistricts 5A, 5-B, and 5-C, effective 8:00 PM Saturday, June 19, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

EO Number: 3-S-SY-11-21

Effective Date: June 20, 2021

Closes personal use salmon fishing and restricts gear in order to conserve king [Chinook] salmon. The following provisions are effective:

5 AAC 77.173. Personal use salmon fishing seasons and periods.

(b)(i) Effective 12:00 noon Sunday, June 20, in Subdistrict 6-C, from the regulatory marker at the mouth of the Wood River upstream to the downstream mouth of the Salcha River, personal use fishing is closed.

5 AAC 77.190. Personal use whitefish and sucker fishery.

(b)(2)(i) Effective 12:00 noon Sunday, June 20, in the Fairbanks Nonsubsistence Area gillnets and fish wheels may not be used to take whitefish and suckers.

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EO Number: 3-S-SY-12-21

Effective Date: June 21, 2021

Closes unrestricted subsistence salmon fishing in Subdistricts 6A, 6-B, the Old Minto Area, the Kantishna River, and the upper Tanana Area.

In Subdistricts 6-A, 6-B, the Old Minto Area, the Kantishna River, and upstream of the Salcha River, subsistence salmon fishing will close effective 8:00 PM Monday, June 21.

EO Number: 3-S-SY-13-21

Effective Date: June 21, 2021

Restricts gillnets of 4-inch or less mesh to 10 fathoms in length during subsistence salmon fishing closures in Subdistricts 6-A, 6-B, the Old Minto Area, the Kantishna River, and the upper Tanana Area. Emergency order number 3-S-SY-12-21 which closed subsistence salmon fishing remains in effect.

In Subdistricts 6-A, 6-B, the Old Minto Area, the Kantishna River, and upstream of the Salcha River, effective 8:00 PM Monday, June 21, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

EO Number: 3-S-SY-14-21

Effective Date: June 23, 2021

Closes unrestricted subsistence salmon fishing in Subdistrict 5-D.

In the lower portion of Subdistrict 5-D, from an ADF&G regulatory marker located approximately 2 miles downstream of Waldron Creek upstream to the Hadweenzic River, subsistence salmon fishing will close effective 8:00 PM Wednesday, June 23.

In the middle portion of Subdistrict 5-D, from the Hadweenzic River upstream to 22 Mile Slough, subsistence salmon fishing will close effective 8:00 PM Saturday, June 26.

In the upper portion of Subdistrict 5-D, from 22 Mile Slough upstream to the United States-Canada border, subsistence salmon fishing will close effective 8:00 PM Monday, June 28.

EO Number: 3-S-SY-15-21

Effective Date: June 23, 2021

Restricts gillnets of 4-inch or less mesh to 10 fathoms in length during subsistence salmon fishing closures in Subdistrict 5-D. Emergency order number 3-S-SY-14-21 which closed subsistence salmon fishing remains in effect.

In the lower portion of Subdistrict 5-D, from an ADF&G regulatory marker located approximately 2 miles downstream of Waldron Creek upstream to the Hadweenzic River, effective 8:00 PM Wednesday, June 23, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

In the middle portion of Subdistrict 5-D, from the Hadweenzic River upstream to 22 Mile Slough, effective 8:00 PM Saturday, June 26, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

In the upper portion of Subdistrict 5-D, from 22 Mile Slough upstream to the United States-Canada border, effective 8:00 PM Monday, June 28, gillnets of 4-inch or less mesh are restricted to 10 fathoms in length.

EO Number: 3-S-SY-16-21

Effective Date: June 26, 2021

Amends 3-S-SY-05-21 and allows the use of 6-inch or smaller mesh gillnets in a portion of the Koyukuk River drainage.

In the Dulbi River and in the Koyukuk River upstream of the Dulbi River, effective 8 PM Saturday, June 26, gillnets of 6-inch or less mesh may be used.

Expiration Date: 8:00 PM Wednesday, June 30, 2021.

Appendix A8.—List of emergency orders (EO) pertaining to the Fall Season in Districts 1–6 fall chum and coho salmon fishery, northern pike subsistence fishery, and personal use whitefish and sucker fishery.

EO Number: 3-NP-Y-01-21

Effective Date: April 16, 2021

This emergency order closes subsistence fishing for northern pike through the ice, in that portion of the Chatanika River from one river mile upstream from the confluence of Goldstream Creek to the Fairbanks Nonsubsistence Area boundary, effective 12:01 AM Friday, April 16. Subsistence fishing for northern pike is allowed when these waters are free of ice.

EO Number: 3-S-FY-01-21

Effective Date: July 16, 2021

This emergency order rescinds 3-S-SY-01-21 and 3-S-SY-03-21 and closes subsistence salmon fishing in Yukon management area District 1 and the Coastal District at 12:01 AM on Friday, July 16; District 2 at 12:01 AM on Monday, July 19; and District 3, including the Innoko River, at 12:01 AM on Wednesday, July 21.

EO Number: 3-S-FY-02-21

Effective Date: July 16, 2021

This emergency order rescinds 3-S-SY-02-21 and 3-S-SY-04-21 and restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in Yukon management area District 1 and the Coastal District at 12:01 AM on Friday, July 16; District 2 at 12:01 AM on Monday, July 19; and District 3, including the Innoko River, at 12:01 AM on Wednesday, July 21.

EO Number: 3-S-FY-03-21

Effective Date: July 22, 2021

This emergency order rescinds 3-S-FY-01-21 to allow additional subsistence salmon fishing gear that requires the release of fall chum and Chinook salmon in Yukon management area Districts 1, 2, and 3, and the Coastal District. Effective 1:00 PM on Thursday, July 22, subsistence fishers may use dip nets and hook and line gear to target pink, sockeye, and coho salmon and nonsalmon. All fall chum and Chinook salmon caught using the selective gear must be released alive.

EO Number: 3-S-FY-04-21

Effective date: July 24, 2021

This emergency order rescinds a portion of 3-S-SY-05-21 to close subsistence salmon fishing and reopen with fishing gear that requires the release of fall chum and Chinook salmon in Yukon management area Subdistrict 4-A Lower including the Anvik River. Effective 12:01 AM on Saturday, July 24, subsistence fishers may use dip nets and hook and line gear to target pink, sockeye, and coho salmon and nonsalmon. All fall chum and Chinook salmon caught using the selective gear must be released alive. Subsistence salmon fishing with other gear types remain closed.

EO Number: 3-S-FY-05-21

Effective Date: July 24, 2021

This emergency order rescinds a portion of 3-S-SY-06-21 and restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in Yukon management area Subdistrict 4-A Lower including the Anvik River effective 12:01 AM on Saturday, July 24.

EO Number: 3-S-FY-06-21

Effective Date: July 28, 2021

This emergency order closes subsistence salmon fishing in Yukon management area Subdistrict 4-A Upper and the Koyukuk River effective 12:01 AM on Wednesday, July 28.

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EO Number: 3-S-FY-07-21

Effective Date: July 28, 2021

This emergency order restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in Yukon management area Subdistrict 4-A Upper including the Koyukuk River drainage effective 12:01 AM on Wednesday, July 28.

EO Number: 3-S-FY-08-21

Effective Date: July 30, 2021

This emergency order closes subsistence salmon fishing in Yukon management area Subdistricts 4-B and 4-C effective 12:01 AM on Friday, July 30.

EO Number: 3-S-FY-09-21

Effective Date: July 30, 2021

This emergency order restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in Yukon management area Subdistricts 4-B and 4-C effective 12:01 AM on Friday, July 30.

EO Number: 3-S-FY-10-21

Effective Date: August 5, 2021

This emergency order closes subsistence salmon fishing in Yukon management area Subdistricts 5-A, 5-B, and 5-C effective 12:01 AM on Thursday, August 5.

EO Number: 3-S-FY-11-21

Effective Date: August 5, 2021

This emergency order restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in Yukon management area Subdistricts 5-A, 5-B, and 5-C effective 12:01 AM on Thursday, August 5.

EO Number: 3-S-FY-12-21

Effective Date: August 16, 2021

This emergency order closes subsistence salmon fishing in Yukon management area Subdistrict 5-D effective 12:01 AM on Monday, August 16.

EO Number: 3-S-FY-13-21

Effective Date: August 16, 2021

This emergency order restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in Yukon management area Subdistrict 5-D effective 12:01 AM on Monday, August 16.

EO Number: 3-S-FY-14-21

Effective Date: August 16, 2021

This emergency order closes subsistence salmon fishing in Yukon management area Subdistricts 6-A and 6-B effective 12:01 AM on Monday, August 16.

EO Number: 3-S-FY-15-21

Effective Date: August 16, 2021

This emergency order restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in Yukon management area Subdistricts 6-A and 6-B effective 12:01 AM on Monday, August 16.

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EO Number: 3-S-FY-16-21

Effective Date: August 16, 2021

This emergency order closes personal use salmon fishing in Subdistrict 6-C effective 12:01 AM on Monday, August 16.

EO Number: 3-S-FY-17-21

Effective Date: August 16, 2021

This emergency order closes subsistence salmon fishing in the upper Tanana Area of District 6 effective 12:01 AM on Monday, August 16.

EO Number: 3-S-FY-18-21

Effective Date: August 16, 2021

This emergency order restricts gillnets of 4-inch or less mesh to a maximum of 10 fathoms in length for subsistence fishing in the upper Tanana Area of District 6 effective 12:01 AM on Monday, August 16.

EO Number: 3-S-FY-19-21

Effective Date: August 28, 2021

This emergency order rescinds 3-S-FY-02-21, 3-S-FY-03-21, 3-S-FY-04-21, and 3-S-FY-05-21 to discontinue live-release subsistence salmon fishing gear used to take salmon, reduce the fishing time with 4-inch or less mesh gillnets, and open dip nets and monitored fish wheels for nonsalmon, releasing fall chum salmon alive. This gear modification would apply to Yukon management area districts 1, 2, and 3, Coastal District, and Subdistrict 4-A Lower effective 8:00 PM Saturday, August 28. The live release of coho salmon from dip nets and monitored fish wheels are also strongly recommended given the historic low run size.

EO Number: 3-S-FY-20-21

Effective Date: August 29, 2021

This emergency order rescinds 3-S-FY-06-21 through 3-S-FY-16-21, and 3-S-FY-18-21, to reduce the fishing time with 4-inch or less mesh gillnets and open dip nets and monitored fish wheels for nonsalmon and releasing fall chum salmon alive. These modifications would apply to Yukon management area Subdistricts 4-A Upper, 4-B, and 4-C and Districts 5 and 6 effective 8:00 PM Sunday, August 29. The live release of coho salmon from dip nets and monitored fish wheels are also strongly recommended given the historic low run size.

EO Number: 3-S-FY-21-21

Effective Date: October 1, 2021

This emergency order rescinds a portion of 3-S-FY-19-21 to reopen subsistence fishing in Yukon management area Coastal District and Districts 1-3. Subsistence fishing will open for 24 hours per day, 7 days per week with 7.5-inch or smaller mesh gillnets effective 8:00 AM Friday, October 1 in the Coastal District and District 1; 8:00 AM Sunday, October 3 in District 2; and 8:00 AM Thursday, October 7 in District 3.

EO Number: 3-S-FY-22-21

Effective Date: October 9, 2021

This emergency order rescinds a portion of 3-S-FY-19-21 and 3-S-FY-20-21 to reopen subsistence fishing in Yukon management area District 4 and leaving the Koyukuk River drainage closed to subsistence salmon fishing. Subsistence fishing will open for 24 hours per day, 7 days per week with 7.5-inch or smaller mesh gillnets effective 8:00 AM Saturday, October 9, in Subdistrict 4-A Lower; 8:00 AM Thursday, October 14, in Subdistrict 4-A Upper; and 8:00 AM Saturday, October 16 in Subdistricts 4-B and 4-C.

The Koyukuk River drainage remains closed to subsistence salmon fishing, but the 4-inch or less mesh gillnet schedule for nonsalmon is relaxed to 7 days per week effective 8:00 AM Saturday, October 30. Selective gear (dip nets and monitored fish wheels) for nonsalmon remains open in the Koyukuk River drainage, where fall chum salmon must be released alive.

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EO Number: 3-S-FY-23-21

Effective Date: October 20, 2021

This emergency order rescinds a portion of 3-S-FY-20-21 to reopen subsistence fishing in Yukon management area District 5 and leave the Teedriinjik and Porcupine River drainages closed to subsistence salmon fishing. Subsistence fishing will open for 24 hours per day, 7 days per week with 7.5-inch or smaller mesh gillnets effective 8:00 AM Wednesday, October 20, in Subdistricts 5-A, 5-B, and 5-C; 8:00 AM Tuesday, October 26, in Subdistrict 5-D Lower; and 8:00 AM Saturday, October 30, in Subdistrict 5-D Middle and Upper.

The Teedriinjik and Porcupine River drainages remain closed to subsistence salmon fishing, but the 4-inch or less mesh gillnet schedule for nonsalmon is relaxed to 7 days per week effective 8:00 AM Saturday, October 30. Selective gear (dip nets and monitored fishwheels) for nonsalmon remains open in the Teedriinjik and Porcupine River drainages, where fall chum salmon must be released alive.

EO Number: 3-S-FY-24-21

Effective Date: October 30, 2021

This emergency order rescinds a portion of 3-S-FY-20-21 to reopen subsistence fishing in the mainstem Tanana River in District 6. Subsistence fishing will open for 24 hours per day, 7 days per week with 7.5-inch or smaller mesh gillnets in the mainstem Tanana River in District 6 effective 8:00 AM Saturday, October 30.

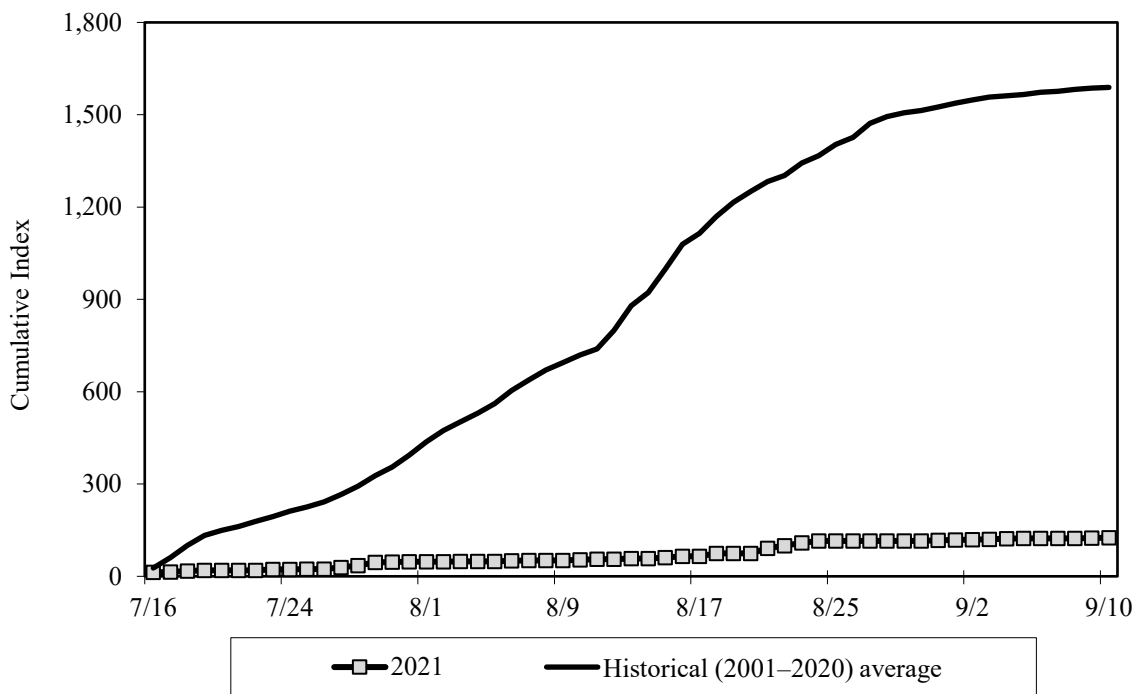
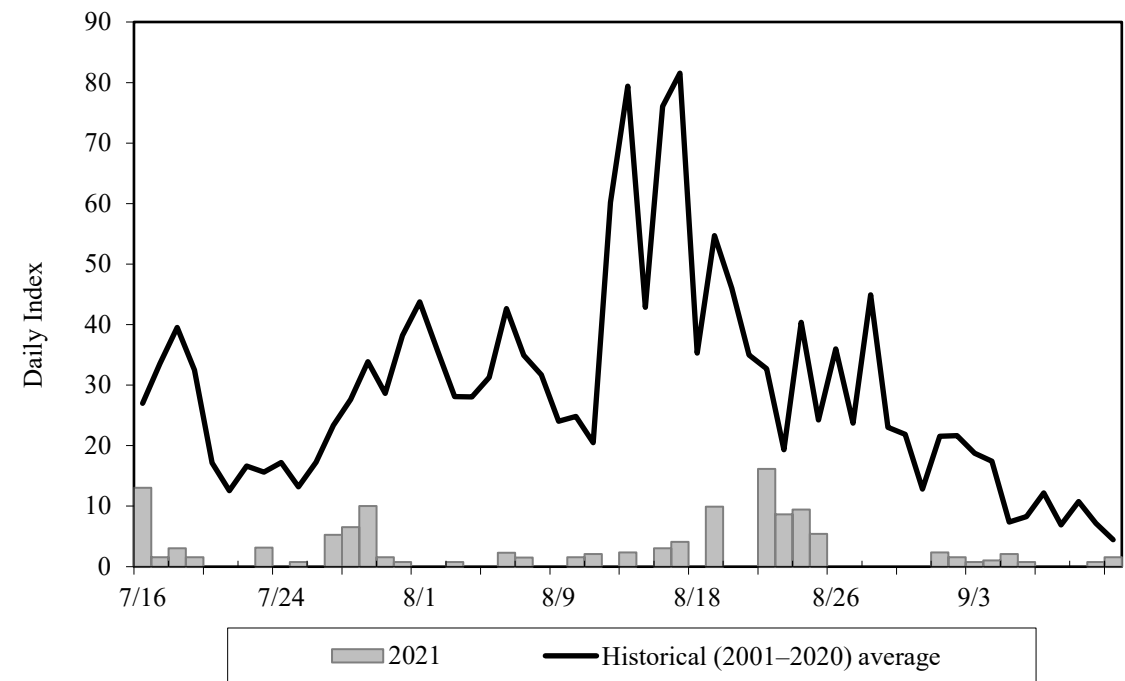
The tributary drainages of the Tanana River remain closed to subsistence salmon fishing, but the 4-inch or less mesh gillnet schedule for nonsalmon is relaxed to 7 days per week effective 8:00 AM Saturday, October 30. Selective gear (dip nets and monitored fishwheels) for nonsalmon remains open in the tributary drainages, where fall chum salmon must be released alive.

EO Number: 3-S-FY-25-21

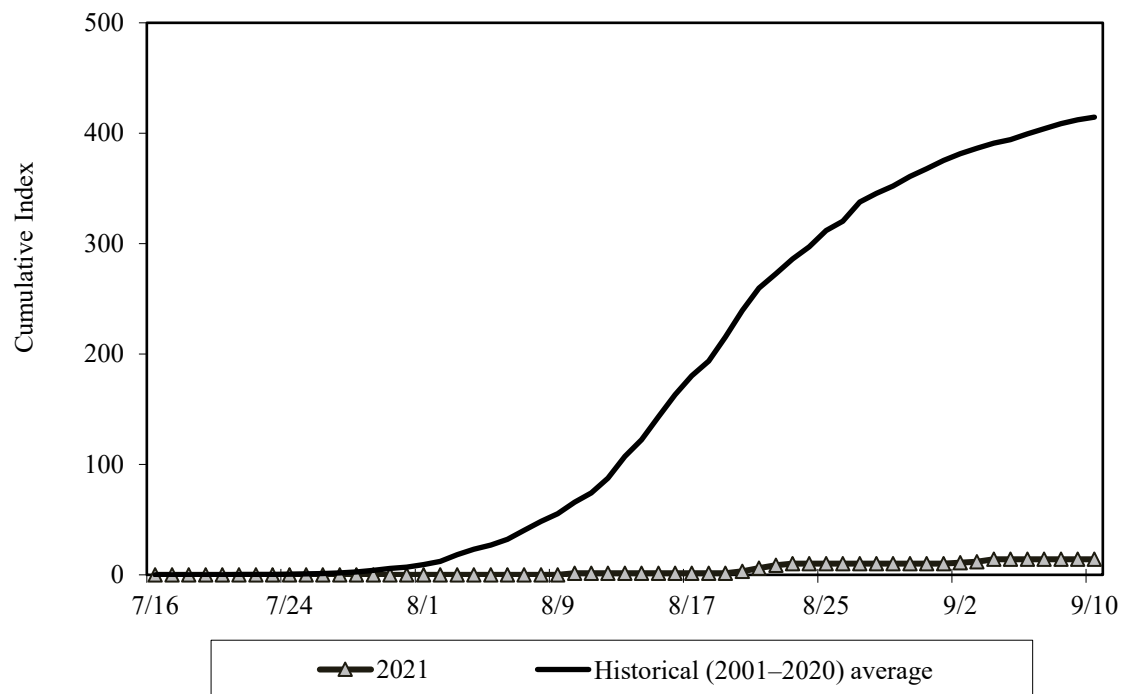
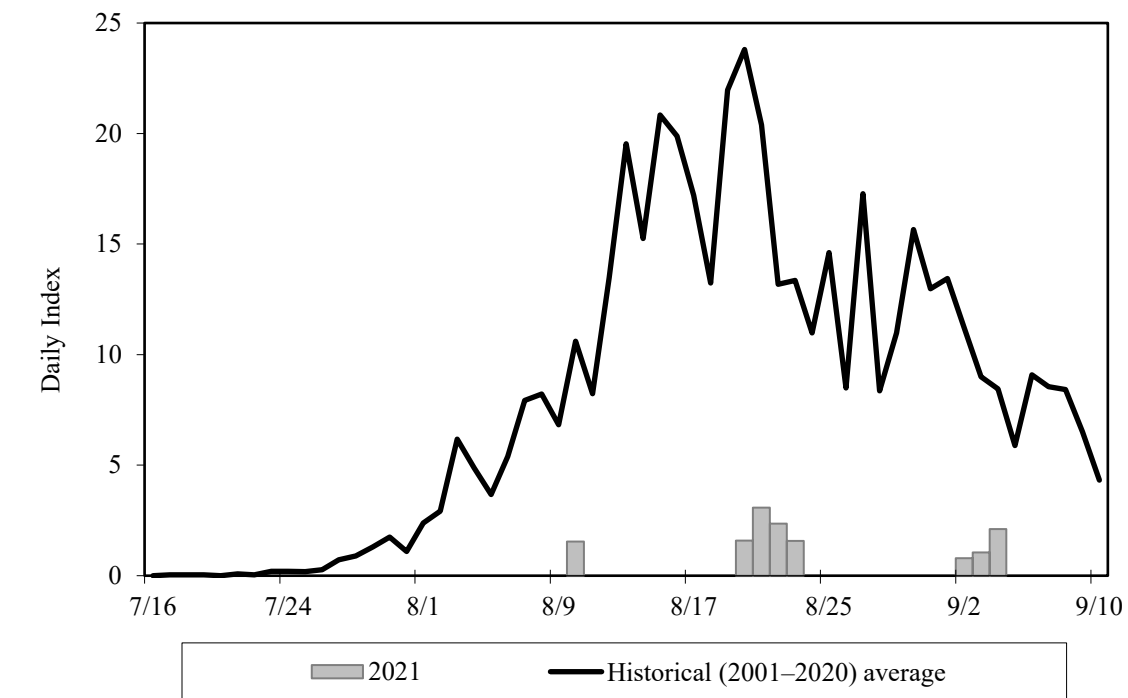
Effective Date: October 16, 2021

This emergency order closes the Personal Use Whitefish and Sucker Fishery with gillnets and fish wheels in Subdistrict 6-C at 12:01 AM on Thursday, October 16, through 12:01 AM on Sunday, October 31.

Appendix A9.—Fall chum salmon daily and cumulative CPUE, Big Eddy and Middle Mouth sites combined, cooperative drift net test fishery, lower Yukon River, 2001–2020 compared to 2021.



Appendix A10.—Coho salmon daily and cumulative CPUE, Big Eddy and Middle Mouth sites combined, cooperative drift net test fishery, lower Yukon River, 2001–2020 compared to 2021.



Appendix A11.—Detailed preliminary salmon spawning escapement estimates for the Yukon River drainage, 2021.

Stream (method)	Date	Survey rating	Chinook	Summer chum	Fall chum	Coho	Agency
Andreafsky River							
West Fork (fixed wing) ^a	—	—	—	—	—	—	ADF&G
East Fork (fixed wing) ^a	—	—	—	—	—	—	ADF&G
East Fork (weir count)	6/18–7/28	—	1,425	2,634	—	—	USFWS
Andreafsky subtotal			1,425	2,634	—	—	
Yukon River near Pilot Station (sonar)	5/31–9/7	—	(124,845)	(153,718)	(145,597)	(37,255)	ADF&G
Anvik River (sonar)	6/15–7/26	—	—	18,819	—	—	ADF&G
Anvik River (fixed wing) ^a	—	—	—	—	—	—	ADF&G
Anvik subtotal			—	18,819	—	—	
Nulato River (fixed wing) ^a	—	—	—	—	—	—	ADF&G
Nulato subtotal			—	—	—	—	
Total lower Yukon River (downstream of Koyukuk River)			1,425	21,453	—	—	
Koyukuk River drainage							
Gisasa River (weir project) ^b	—	—	—	—	—	—	USFWS
Gisasa River (fixed wing) ^a	—	—	—	—	—	—	ADF&G
Billy Hawk Creek (fixed wing) ^a	—	—	—	—	—	—	ADF&G
Dakli River (fixed wing) ^a	—	—	—	—	—	—	ADF&G
Caribou Creek (fixed wing) ^a	—	—	—	—	—	—	ADF&G
Henshaw Creek (weir project)	6/28–7/29	—	130	3,729	—	—	TCC
Henshaw Creek (fixed wing) ^a	—	—	—	—	—	—	ADF&G
Koyukuk River drainage subtotal			130	3,729	—	—	
Total Yukon River (downstream of Tanana River)			1,555	25,182	—	—	

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Stream (method)	Date	Survey rating	Chinook	Summer chum	Fall chum	Coho	Agency
Tanana River Drainage							
Kantishna River Drainage (helicopter)							
Clear Creek	11/10	Incomplete	–	–	0	0	ADF&G
Barton Creek	11/10	Poor	–	–	21	18	ADF&G
Toklat River	11/10	Good	–	–	455	3	ADF&G
Kantishna subtotal			–	–	476	21	
Nenana River drainage (helicopter)							
Nenana River (Teklanika River–upstream 8 miles)	10/27	Good	–	–	1	104	ADF&G
Seventeenmile Slough	10/27	Good	–	–	41	213	ADF&G
Lost Slough	10/27	Good	–	–	483	126	ADF&G
Julius Creek			–	–	–	–	ADF&G
Clear Creek	10/27	Good	–	–	0	0	ADF&G
Glacier Creek	10/27	Good	–	–	0	0	ADF&G
Wood Creek	10/27	Good	–	–	0	226	ADF&G
Teklanika River Spings	10/27	Fair	–	–	0	20	ADF&G
Nenana subtotal			–	–	525	689	
Chena River (counting tower/sonar)	6/23–8/8	–	1,417	577	–	–	ADF&G
Salcha River (counting tower/sonar)	6/30–8/10	–	2,082	2,193	–	–	ADF&G
Richardson Clearwater River (helicopter)	11/12	Good	–	–	0	17	ADF&G
Clear Creek (helicopter)	11/12	Poor	–	–	2	2	ADF&G
Mainstem Tanana Sloughs (helicopter)							
Benchmark No 735 Slough	11/12	Good	–	–	150	7	ADF&G
Andersen Slough	11/12	Incomplete	–	–	0	0	ADF&G
Whitestone Slough	11/12	Incomplete	–	–	0	0	ADF&G
Rika's Roadhouse vicinity	11/12	Fair	–	–	771	1	ADF&G
Bluff Cabin Slough	11/12	Fair	–	–	1,085	2	ADF&G
Clearwater Lake Outlet Slough	11/12	Fair	–	–	607	11	ADF&G
Mainstem Tanana Sloughs subtotal			–	–	2,613	21	

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Stream (method)	Date	Survey rating	Chinook	Summer chum	Fall chum	Coho	Agency
Delta River							
Foot survey (peak foot survey)	11/2, 12/1	Good	—	—	1,613	15	ADF&G
Blue Creek (foot survey)	11/18	Good	—	—	0	7	ADF&G
Blue Creek (helicopter)	11/12	Good	—	—	(3)	(3)	ADF&G
Bluff Cabin Creek (helicopter)	11/12	Good	—	—	6	6	ADF&G
Delta Clearwater River Index Area (peak boat survey)	11/2	Good	—	—	1	913	ADF&G
Clearwater Lake Outlet (helicopter)	11/12	Good	—	—	2	130	ADF&G
Total Tanana River			3,499	2,770	5,238	1,821	
Teedriinjik River (sonar)	8/8–9/27	—	—	—	21,162	—	USFWS
Yukon River near Eagle (sonar) ^c	6/28–10/6	—	(31,796)	—	(23,170)	—	ADF&G/DFO
Total Alaska portion of drainage observed escapements			5,054	27,952	26,400	1,821	
Yukon Territory streams							
Porcupine River drainage (Canada)							
Porcupine River (sonar minus Canada harvest)	7/1–9/29	—	411	—	3,486	—	DFO ^d
Fishing Branch (weir/sonar)	9/7–10/21	—	—	—	(2,413)	—	DFO ^d
Mainstem Yukon River sites - Canada							
Klondike River (sonar) ^c	7/1–8/13	—	(851)	—	—	—	DFO ^d
Kluane River (fixed wing)	10/25	Undefined	—	—	(64)	—	DFO ^d
Pelly River (sonar) ^{c, e}	7/1–8/25	—	(4,980)	—	—	—	DFO ^d
Tatchun Creek (weir)	7/21–9/7	—	(17)	—	—	—	DFO ^d
Yukon River Index Area	10/19	Undefined	—	—	(1,131)	—	DFO ^d
Big Salmon River (sonar) ^c	7/13–8/20	—	(1,957)	—	—	—	DFO ^d
Takhini River (sonar)	7/29–9/6	—	(257)	—	—	—	DFO ^d
Whitehorse Fishway (fish ladder with window)	7/20–8/29	—	(274)	—	—	—	DFO ^d
Subtotal mainstem sites			(9,034)	—	(1,195)	—	

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Stream (drainage)	Survey rating	Chinook	Summer chum	Fall chum	Coho	Agency
Canada mainstem Yukon River						
Border passage estimate (Eagle sonar minus U.S. harvest)	–	(31,758)	–	(23,170)	–	ADF&G/DFO
Canada escapement estimate (border passage minus Canada harvest) ^f	–	31,452	–	23,170	–	ADF&G/DFO
Total Yukon Territory ^g		31,863	–	26,656	–	
Yukon River drainage total observed escapements		36,917	27,952	53,056	1,821	

Note: Data in parentheses are not included in subtotals or totals. Surveys rated anything other than "Good or Fair" should not be used without reviewing the entire history of the system to determine relevance.

^a Survey not flown due to weather and high water

^b Project did not operate in 2021 due to COVID-19 related travel restrictions.

^c Includes postseason expansion for targeted salmon species.

^d Yukon Territory counts provided by DFO but are operated by various contractors mostly funded by Restoration and Enhancement Funds.

^e Includes preseason expansion of Chinook salmon.

^f Canada border passage estimate for Yukon Territory streams (excluding the Porcupine River).

^g Yukon Territory counts include Canada mainstem Yukon River escapement estimate plus Porcupine River.

APPENDIX B: ESCAPEMENT GOALS AND BACKGROUND INFORMATION

Appendix B1.—List of indigenous fishes found in the Yukon management area.

Species code ^a	Scientific name	Common name
601	<i>Lampetra camtschatica</i>	Arctic lamprey
570	<i>Stenodus leucichthys</i>	Inconnu (sheefish)
588	<i>Coregonus nasus</i>	Broad whitefish
589	<i>Coregonus pidschian</i>	Humpback whitefish
583	<i>Coregonus sardinella</i>	Least cisco
585	<i>Coregonus laurettae</i>	Bering cisco
586	<i>Prosopium cylindraceum</i>	Round whitefish
587	<i>Prosopium coulteri</i>	Pygmy whitefish
610	<i>Thymallus arcticus</i>	Arctic grayling
550	<i>Salvelinus namaycush</i>	Lake trout
520	<i>Salvelinus alpinus</i>	Arctic char
530	<i>Salvelinus malma</i>	Dolly varden
410	<i>Oncorhynchus tshawytscha</i>	Chinook salmon
420	<i>Oncorhynchus nerka</i>	Sockeye salmon
430	<i>Oncorhynchus kisutch</i>	Coho salmon
440	<i>Oncorhynchus gorbuscha</i>	Pink salmon
450	<i>Oncorhynchus keta</i>	Chum salmon
513	<i>Osmerus mordax</i>	Rainbow smelt
514	<i>Hypomesus olidus</i>	Pond smelt
500	<i>Esox lucius</i>	Northern pike
630	<i>Dallia pectoralis</i>	Alaska blackfish
650	<i>Couesius plumbeus</i>	Lake chub
640	<i>Catostomus catostomus</i>	Longnose sucker
670	<i>Percopsis omiscomaycus</i>	Trout perch
590	<i>Lota lota</i>	Burbot (lush)
661	<i>Pungitius pungitius</i>	Ninespine stickleback
162	<i>Cottus cognatus</i>	Slimy sculpin
Estuarine species		
113	<i>Eleginus gracilis</i>	Saffron cod
122	<i>Liopsetta glacialis</i>	Arctic flounder
127	<i>Limanda aspera</i>	Yellowfin sole
129	<i>Platichthys stellatus</i>	Starry flounder
192	<i>Hexagrammos stelleri</i>	Whitespotted greenling
230	<i>Clupea pallasii</i>	Pacific herring
516	<i>Mallotus villosus</i>	Capelin
NA	<i>Megalocottus platycephalus</i>	Belligerent sculpin

Note: Includes fishes found in the Yukon River drainage in Canada. NA = not available.

^a The species code is a 3-digit number that identifies the species of fish caught on harvest fish ticket.

Appendix B2.—Origins of Yukon River drainage salmon spawning escapement goals by species.

Stock/Location	Goal Type	Goals	Year established	Primary source
<i>Chinook salmon stock</i>				
E. Fork Andreafsky River	SEG	2,100–4,900	2010	Volk et al. (2009)
W. Fork Andreafsky River	SEG	640–1,600	2005	ADF&G (2004)
Anvik River	SEG	1,100–1,700	2005	ADF&G (2004)
Nulato River (forks combined)	SEG	940–1,900	2005	ADF&G (2004)
Chena River	BEG	2,800–5,700	2001	Evenson (2002)
Salcha River	BEG	3,300–6,500	2001	Evenson (2002)
Canada upper Yukon River	IMEG	42,500–55,000	2010	JTC (2010)
<i>Summer chum salmon stock</i>				
Yukon River Drainage	BEG	500,000–1,200,000	2016	Hamazaki and Conitz (2015)
E. Fork Andreafsky River	SEG	>40,000	2010	Fleischman and Evenson (2010)
Anvik River	BEG	350,000–700,000	2005	ADF&G (2004)
<i>Fall chum salmon stock</i>				
Yukon River Drainage	SEG	300,000–600,000	2010	Fleischman and Borba (2009)
Delta River	SEG	7,000–20,000	2019	Liller and Savereide (2018)
Teedriinjik River	SEG	85,000–234,000	2019	Liller and Savereide (2018)
Canada upper Yukon River	IMEG	70,000–104,000	2010	JTC (2010)
Fishing Branch River	IMEG	22,000–49,000	2008	JTC (2008)
<i>Coho salmon stock</i>				
Delta Clearwater River	SEG	5,200–17,000	2004	ADF&G (2004)

Secondary Source: JTC 2022.

Note: Sustainable escapement goal (SEG), biological escapement goal (BEG), and interim management escapement goal (IMEG). Sheenjek River and upper Yukon Tributaries fall chum salmon goals were discontinued in 2016. Tanana River fall chum salmon goal was discontinued in 2019.

Appendix B3.—Selected environmental and salmon catch information, Yukon River drainage, 2001–2021.

Year	Average Nome April air temp (°F) ^a	Tanana River Nenana ice breakup	Iceout Yukon Delta Area	First Chinook caught Yukon Delta Area ^b	First summer chum caught Yukon Delta Area ^b	First District 1 commercial period
2001	22	5/8	6/5	6/7	6/9	—
2002	20	5/7	5/24	5/31	5/30	6/20
2003	26	4/29	5/17	5/22	5/30	6/16
2004	29	4/24	5/8	5/18	5/27	6/17
2005	15	4/28	5/17	5/25	6/1	6/24
2006	12	5/2	5/29	6/6	6/7	6/19
2007	27	4/27	5/18	6/3	6/12	6/18
2008	15	5/5	5/24	6/3	6/16	7/2
2009	17	5/1	5/26	6/5	6/10	6/20
2010	20	4/29	5/22 ^c	6/9	6/10	6/28
2011	18	5/4	5/22	5/31	6/4	6/24
2012	20	4/23	5/25	6/8	6/9	6/29
2013	16	5/20	6/3	6/10	6/10	6/18
2014	28	4/25	5/10	5/19	5/15	6/9
2015	22	4/24	5/16	5/27	5/24	6/11
2016	34	4/23	5/3	5/23	5/16	6/7
2017	30	5/1	5/14	5/26	5/21	6/10
2018	26	5/1	5/18	5/27	5/27	6/9
2019	23	4/14	5/8	6/2	6/3	7/3
2020	25	4/27	5/14	5/27	5/28	6/27
2021	21	5/11	5/13	5/28 ^d	5/30	—
Averages						
2001–2020	22	4/29	5/19	5/30	6/1	6/19
2011–2020	24	4/28	5/16	5/29	5/28	6/17
2016–2020	28	4/25	5/11	5/27	5/25	6/17

Note: ADF&G maintains this table back to 1961. En dashes (–) = no data.

^a Source for 2006–2021: <https://akclimate.org/data/data-portal/> (Accessed April 29, 2022).

^b Subsistence or test fishery.

^c Though breakup on the lower Yukon River occurred May 22, shore-fast sea ice persisted until later than usual in the season.

^d A Chinook salmon was caught on May 31 during the first day of operations of the Pilot Station sonar test fishery. Based on travel time, this fish probably passed Emmonak around May 28. The first Chinook salmon caught in the Lower Yukon test fishery was on June 4.

Appendix B4.—Pilot Station sonar project estimates with confidence intervals, Yukon River drainage, 2001–2021.

Year ^a	Chinook	CI (+/-)	Summer chum	CI (+/-)	Fall chum	CI (+/-)	Coho ^b	CI (+/-)	Pink	CI (+/-)	Other ^c	CI (+/-)	Total
2001 ^d	121,089	14,980	442,546	24,187	408,961	31,818	160,272	19,429	2,846	2,210	265,749	19,864	1,401,463
2002	151,713	39,971	1,097,769	51,097	367,886	28,800	137,077	12,648	123,698	19,320	405,534	34,949	2,283,677
2003	318,088	28,555	1,183,009	60,649	923,540	59,306	280,552	33,395	11,370	3,703	379,651	28,958	3,096,210
2004	200,761	19,979	1,344,213	49,946	633,368	36,529	207,844	19,630	399,339	33,773	391,939	32,694	3,177,464
2005 ^e	259,014	42,452	2,570,697	78,867	1,893,688	110,806	194,372	29,319	61,091	11,294	427,406	33,091	5,406,268
2006	228,763	27,696	3,780,760	155,452	964,238	45,647	163,889	18,167	183,006	23,648	531,047	61,868	5,851,703
2007	170,246	25,535	1,875,491	74,394	740,195	46,349	192,406	19,259	126,282	22,462	761,657	61,118	3,866,277
2008	175,046	21,367	1,849,553	68,542	636,525	30,023	145,378	13,885	580,127	86,243	306,225	62,727	3,692,854
2009 ^d	177,796	26,130	1,477,186	69,895	274,227	38,552	240,779	29,211	34,529	12,597	589,916	51,608	2,794,433
2010	137,899	61,122	1,423,372	89,356	458,103	40,796	177,724	12,489	919,036	639,693	567,454	77,005	3,683,588
2011	148,797	20,174	2,051,501	77,486	873,877	42,660	149,533	20,770	9,754	2,983	453,537	33,086	3,686,999
2012	127,555	18,652	2,136,476	79,036	778,158	62,184	130,734	15,795	420,344	59,823	464,058	36,973	4,057,325
2013	136,805	32,901	2,849,683	114,602	865,295	72,277	110,515	23,297	6,126	6,495	732,009	56,810	4,700,433
2014	163,895	18,735	2,020,309	98,909	706,630	61,902	283,421	28,112	679,126	59,992	584,831	44,731	4,438,212
2015	146,859	30,958	1,591,505	98,413	669,483	40,757	121,193	14,614	39,690	12,436	853,989	74,749	3,422,755
2016	176,898	18,467	1,921,748	80,516	994,760	64,435	168,297	18,403	1,364,849	87,144	355,365	40,381	4,981,917
2017	263,014	29,110	3,093,735	138,259	1,829,931	89,124	166,320	33,528	166,529	31,240	796,199	64,315	6,315,728
2018	161,831	24,538	1,612,688	107,348	928,664	55,042	136,347	11,895	689,607	47,967	547,959	45,925	4,077,096
2019	219,624	20,477	1,402,925	85,902	842,041	37,151	86,401	9,529	42,353	8,893	568,576	48,598	3,161,920
2020	162,252	18,967	692,602	36,325	262,439	17,810	107,680	6,843	207,942	18,745	388,287	29,526	1,821,202
2021	124,845	10,831	153,718	16,149	146,197	11,686	37,255	3,879	22,181	5,832	556,464	33,992	1,040,660
Averages													
2001–2020	179,657		1,741,499		771,343		161,809		289,992		520,374		3,795,876
2011–2020	170,753		1,937,317		875,128		146,044		362,632		574,481		4,066,359
2016–2020	196,724		1,744,740		971,567		133,009		494,256		531,277		4,071,573

Note: CI = confidence interval, calculated at 90%.

^a Estimates for all years were generated with the most current apportionment model.

^b Estimate may not include entire run. Operations were extended to September 7 in 2008–2014, 2017–2018, and 2020–2021, instead of the usual end date of August 31.

^c Includes sockeye salmon, cisco, whitefish, sheefish, burbot, suckers, Dolly Varden, and northern pike.

^d Estimates are speculative. High waters were present all season in 2001. High water during summer (June/July) and extremely low water during the fall season (August/September) were present in 2009.

^e Estimates include extrapolations for the dates June 10 to June 18 to account for the time before the DIDSON was deployed.

Appendix B5.—Chinook salmon run timing, 2001–2021.

Year	Timing	First catch at LYTF ^b	Pilot Station estimate	Pilot Station date			Day gap ^a		
				First quartile	Median	Third quartile	First quartile and median	Median and third quartile	First quartile and third quartile
2001	–	8 Jun	121,089	20 Jun	27 Jun	3 Jul	7	6	13
2002	–	1 Jun	151,713	17 Jun	24 Jun	1 Jul	7	7	14
2003	Early	27 May	318,088	14 Jun	17 Jun	26 Jun	3	9	12
2004	–	28 May	200,761	17 Jun	24 Jun	30 Jun	7	6	13
2005	–	2 Jun	259,015	15 Jun	24 Jun	29 Jun	9	5	14
2006	Late	6 Jun	228,763	24 Jun	27 Jun	30 Jun	3	3	6
2007	–	3 Jun	170,246	19 Jun	25 Jun	1 Jul	6	6	12
2008	Late	3 Jun	175,046	24 Jun	30 Jun	2 Jul	6	2	8
2009	–	5 Jun	177,796	24 Jun	28 Jun	1 Jul	4	3	7
2010	Late	9 Jun	137,899	22 Jun	26 Jun	30 Jun	4	4	8
2011	–	3 Jun	148,797	20 Jun	23 Jun	–	3	8	11
2012	Late	11 Jun	127,555	24 Jun	28 Jun	2 Jul	4	4	8
2013	Late	13 Jun	136,805	22 Jun	26 Jun	2 Jul	4	6	10
2014	Early	26 May	163,895	13 Jun	19 Jun	24 Jun	6	5	11
2015	–	28 May	146,859	19 Jun	24 Jun	29 Jun	5	5	10
2016	–	24 May	176,898	15 Jun	21 Jun	27 Jun	6	6	12
2017	–	31 May	263,014	17 Jun	21 Jun	28 Jun	4	7	11
2018	Late	7 Jun	161,831	19 Jun	26 Jun	1 Jul	7	5	12
2019	Late	2 Jun	219,624	20 Jun	26 Jun	2 Jul	6	6	12
2020	Late	30 May	162,252	23 Jun	27 Jun	3 Jul	4	6	10
2021	Late	1 Jun	124,874	19 Jun	29 Jun	4 Jul	10	5	15
Averages									
All years ^c		2 Jun	182,131	18 Jun	23 Jun	29 Jun	5	6	11
Late years		6 Jun	155,260	22 Jun	26 Jun	1 Jul	5	4	9
Early years		26 May	240,992	13 Jun	18 Jun	24 Jun	5	7	12
2016–2020		30 May	196,724	18 Jun	23 Jun	29 Jun	6	6	11

Note: Run timing is defined postseason based on the date of the median quartile (i.e., the midpoint of passage) at Pilot Station sonar. En dashes (–) = no data.

^a “Day gap” refers to the number of days between quartiles at Pilot Station sonar.

^b “First Catch” of salmon from the Lower Yukon Test Fishery (LYTF) is listed here for reference. This project is located approximately 123 miles downstream from Pilot Station sonar; the first catch of salmon is usually not the first large group of salmon.

^c “All years” does not include 2001, 2009, and 2019.

Appendix B6.–Summer chum salmon run timing, 2001–2021.

Year	Timing	First catch at LYTF ^{b, c}	Pilot Station total estimate	Pilot Station date			Day gap ^a		
				First quartile	Median	Third quartile	First quartile and median	Median and third quartile	First quartile and third quartile
2001	–	9 Jun	442,546	24 Jun	29 Jun	5 Jul	5	6	11
2002	–	30 May	1,097,769	20 Jun	25 Jun	1 Jul	5	6	11
2003	Late	30 May	1,183,009	24 Jun	1 Jul	6 Jul	7	5	12
2004	–	–	1,344,213	22 Jun	27 Jun	4 Jul	5	7	12
2005	Late	6 Jun	2,570,696	23 Jun	1 Jul	8 Jul	8	7	15
2006	–	7 Jun	3,780,760	20 Jun	26 Jun	1 Jul	6	5	11
2007	–	–	1,875,491	22 Jun	28 Jun	5 Jul	6	7	13
2008	Late	16 Jun	1,849,553	26 Jun	30 Jun	8 Jul	4	8	12
2009	–	10 Jun	1,477,186	26 Jun	28 Jun	4 Jul	2	6	8
2010	–	10 Jun	1,415,027	23 Jun	28 Jun	1 Jul	5	3	8
2011	–	3 Jun	2,051,501	22 Jun	26 Jun	4 Jul	4	8	12
2012	–	9 Jun	2,136,476	24 Jun	29 Jun	5 Jul	5	6	11
2013	–	10 Jun	2,849,683	22 Jun	28 Jun	2 Jul	6	4	10
2014	–	9 Jun	2,020,309	18 Jun	26 Jun	30 Jun	8	4	12
2015	–	24 May	1,591,505	21 Jun	28 Jun	3 Jul	7	5	12
2016	Early	22 May	1,921,748	17 Jun	24 Jun	5 Jul	7	11	18
2017	Early	22 May	3,093,735	19 Jun	23 Jun	29 Jun	4	6	10
2018	–	30 May	1,612,688	21 Jun	29 Jun	5 Jul	8	6	14
2019	Late	3 Jun	1,402,925	29 Jun	3 Jul	5 Jul	4	2	6
2020	Late	31 May	692,602	27 Jun	1 Jul	9 Jul	4	8	12
2021	Late	30 May	153,497	30 Jun	6 Jul	11 Jul	6	5	11
Averages									
All years ^d		3 Jun	1,901,899	22 Jun	27 Jun	3 Jul	6	6	12
Late years		6 Jun	1,540,135	26 Jun	1 Jul	7 Jul	5	6	11
Early years		22 May	2,124,867	18 Jun	23 Jun	1 Jul	6	6	12
2016–2020		27 May	1,744,740	22 Jun	28 Jun	4 Jul	5	7	12

Note: Run timing is defined postseason based on the date of the median quartile (i.e., the midpoint of passage) at Pilot Station sonar. En dashes (–) = no data.

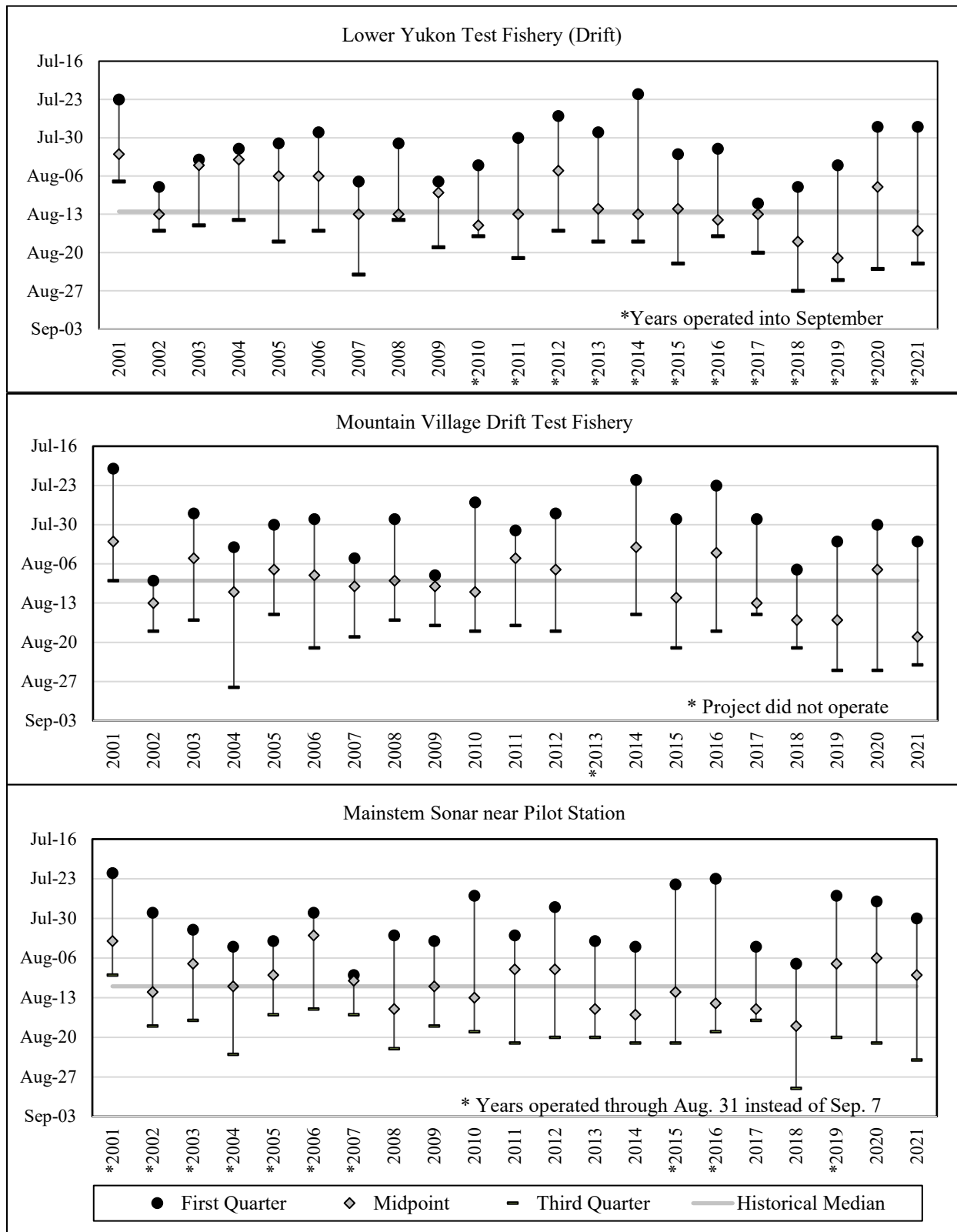
^a “Day gap” means the number of days between quartiles at Pilot Station sonar.

^b “First catch” of salmon from the Lower Yukon test fishery (LYTF) is listed here for reference. This project is located approximately 123 miles downstream from Pilot Station sonar; the first catch of salmon is usually not the first large group of salmon.

^c Lower Yukon test fishery did not fish for summer chum salmon in 2004 and 2007.

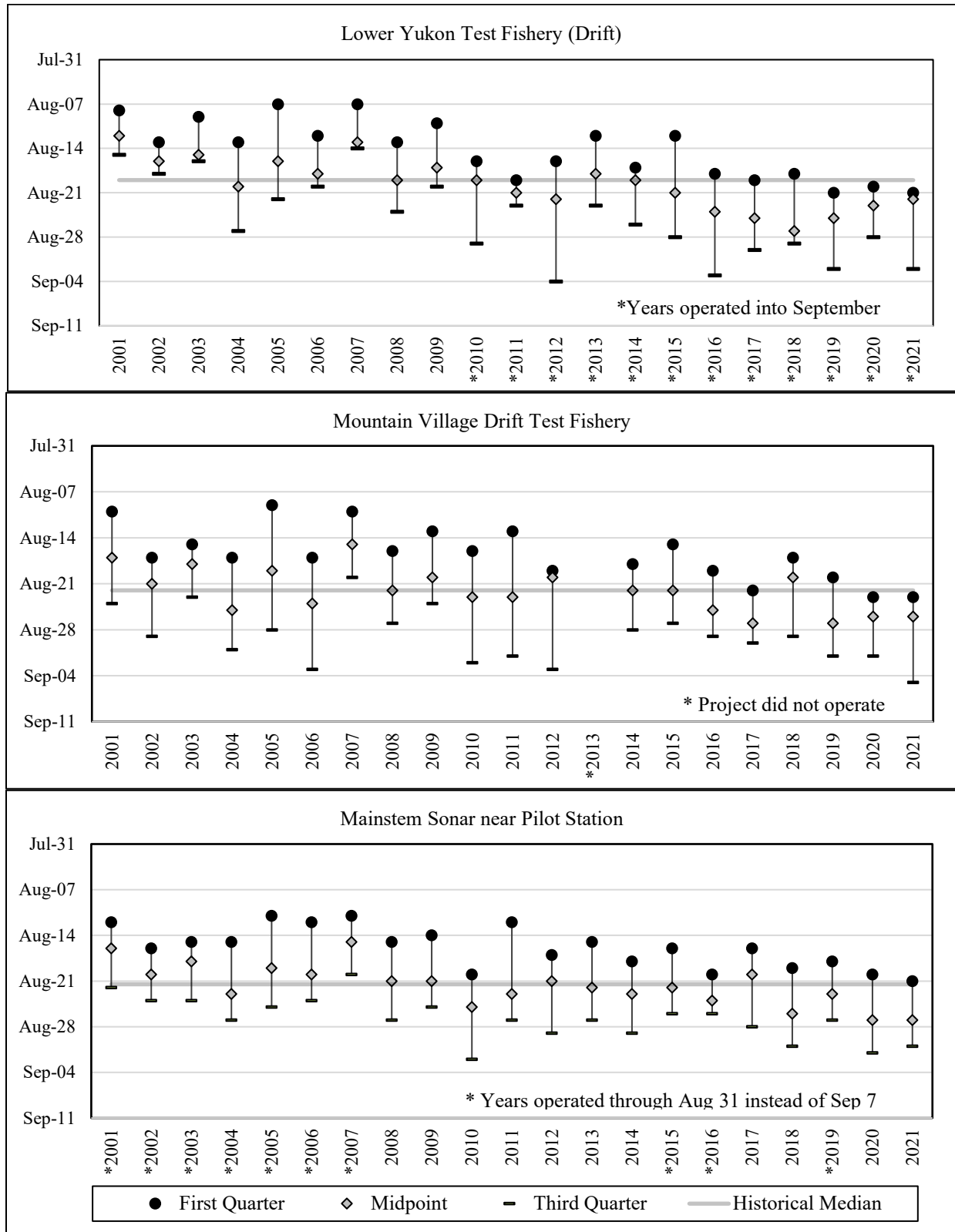
^d “All years” does not include 2001, 2009, and 2021.

Appendix B7.—Fall chum salmon run timing, 2001–2021.



Note: Run timing for all locations does not compensate for downriver harvest. The Mountain Village test fishery is operated by Sandone Consulting, LLC and sponsored by the Asa'carsarmuit Traditional Council.

Appendix B8.—Coho salmon run timing, 2001–2021.



Note: Run timing for all locations does not compensate for downriver harvest. The Mountain Village test fishery is operated by Sandone Consulting, LLC and sponsored by the Asa'carsarmuit Traditional Council.

Appendix B9.–Pilot Station sonar Chinook salmon passage and Canada-origin proportion by stratum, 2005–2021.

Year	Strata	Dates	Pilot Station passage	Proportion of run	Canada proportion ^a	Estimated number of Canada fish
2005	Stratum 1	06/04 – 06/17	91,136	0.35	0.57	51,998
	Stratum 2	06/18 – 07/03	119,607	0.46	0.43	51,925
	Stratum 3	07/04 – 08/20	48,271	0.19	0.27	13,231
	Total		259,014	1.00	0.45	117,155
2006	Stratum 1	06/08 – 06/20	37,986	0.17	0.48	18,317
	Stratum 2	06/21 – 06/28	96,569	0.42	0.43	41,766
	Stratum 3	06/29 – 07/03	57,940	0.25	0.36	20,870
	Stratum 4	07/04 – 07/26	36,268	0.16	0.35	12,789
	Total		228,763	1.00	0.40	93,742
2007	Stratum 1	06/06 – 06/19	50,083	0.29	0.52	26,207
	Stratum 2	06/20 – 06/30	62,907	0.37	0.35	21,787
	Stratum 3	07/01 – 08/16	57,256	0.34	0.20	11,203
	Total		170,246	1.00	0.35	59,197
2008	Stratum 1	06/01–06/23	41,294	0.24	0.48	19,679
	Stratum 2	06/24–06/29	42,554	0.24	0.33	14,157
	Stratum 3	06/30–09/06	91,198	0.52	0.34	30,731
	Total		175,046	1.00	0.37	64,568
2009	Stratum 1	06/09–06/22	34,229	0.19	0.48	16,490
	Stratum 2	06/23–06/29	83,866	0.47	0.35	29,490
	Stratum 3	06/30–07/31	59,701	0.34	0.16	9,335
	Total		177,796	1.00	0.31	55,315
2010	Stratum 1	06/12–06/21	28,885	0.21	0.53	15,281
	Stratum 2	06/22–06/27	45,306	0.33	0.52	23,442
	Stratum 3	06/28–09/05	63,708	0.46	0.27	17,435
	Total		137,899	1.00	0.41	56,159
2011	Stratum 1	06/01–06/18	31,273	0.21	0.55	17,245
	Stratum 2	06/19–06/27	67,686	0.45	0.35	23,663
	Stratum 3	06/28–08/07	49,838	0.33	0.16	7,803
	Total		148,797	1.00	0.33	48,711
2012	Stratum 1	06/10–06/24	31,998	0.25	0.40	12,951
	Stratum 2	06/25–07/02	63,648	0.50	0.44	28,192
	Stratum 3	07/03–07/30	31,909	0.25	0.32	10,318
	Total		127,555	1.00	0.40	51,461
2013	Stratum 1	06/14–06/24	64,830	0.47	0.74	48,244
	Stratum 2	06/25–07/01	26,362	0.19	0.44	11,673
	Stratum 3	07/02–08/02	45,613	0.33	0.18	8,421
	Total		136,805	1.00	0.50	68,337
2014	Stratum 1	06/03–06/14	45,236	0.28	0.50	22,450
	Stratum 2	06/15–06/24	82,146	0.50	0.42	34,198
	Stratum 3	06/25–08/04	36,513	0.22	0.18	6,725
	Total		163,895	1.00	0.39	63,373
2015	Stratum 1	05/30–06/17	30,600	0.21	0.49	15,061
	Stratum 2	06/18–06/26	51,172	0.35	0.37	18,736
	Stratum 3	06/27–08/17	65,087	0.44	0.33	21,352
	Total		146,859	1.00	0.38	55,149

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Year	Strata	Dates	Pilot Station passage	Proportion of run	Canada proportion ^a	Estimated number of Canada fish
2016	Stratum 1	05/30–06/14	37,511	0.21	0.52	19,354
	Stratum 2	06/15–06/25	86,622	0.49	0.34	29,678
	Stratum 3	06/26–08/24	52,765	0.30	0.53	27,985
	Total		176,898	1.00	0.44	77,016
2017	Stratum 1	05/31–06/20	110,001	0.42	0.43	47,817
	Stratum 2	06/21–06/25	69,392	0.26	0.40	28,072
	Stratum 3	06/26–08/11	83,621	0.32	0.40	33,346
	Total		263,014	1.00	0.42	109,236
2018	Stratum 1	06/02–06/24	72,545	0.45	0.47	33,967
	Stratum 2	06/25–07/03	57,070	0.35	0.40	22,889
	Stratum 3	07/04–08/05	32,216	0.20	0.28	8,864
	Total		161,831	1.00	0.41	65,720
2019	Stratum 1	06/02–06/23	82,035	0.37	0.56	45,637
	Stratum 2	06/24–06/30	73,551	0.34	0.42	30,563
	Stratum 3	07/01–08/24	64,038	0.29	0.36	22,910
	Total		219,624	1.00	0.45	99,110
2020 ^b	Stratum 1	06/07–06/22	34,551	0.21	0.63	21,891
	Stratum 2	06/23–06/29	64,298	0.40	0.48	30,873
	Stratum 3	06/30–07/06	35,047	0.22	0.44	15,453
	Stratum 4	07/07–08/17	28,356	0.17	0.37	10,468
	Total		162,252	1.00	0.48	78,685
2021	Stratum 1	05/31–06/22	44,751	0.36	0.62	27,527
	Stratum 2	06/23–07/06	59,173	0.47	0.54	32,065
	Stratum 3	07/07–08/06	20,921	0.17	0.35	7,409
	Total		124,845	1.00	0.54	67,001
Average annual proportion of Canada stock					0.40	
Minimum annual proportion of Canada stock					0.31	
Maximum annual proportion of Canada stock					0.50	

Note: Average, minimum, and maximum values exclude the most recent year data.

^a The total Canada proportion is weighted using the proportion of run.

Appendix B10.—Reconstructed drainagewide Yukon River Chinook salmon run size, 2001–2021.

Year	Harvest below Pilot Station sonar ^a	Total Andreafsky River ^b	Pilot Station sonar	Drainagewide run ^c
2001	18,915	2,296	121,089	142,300
2002	31,660	8,246	151,713	191,619
2003	47,911	8,672	318,088	374,671
2004	61,717	16,090	200,761	278,568
2005	40,469	4,478	259,015	303,962
2006	50,802	12,926	228,763	292,491
2007	44,656	9,008	170,246	223,910
2008	17,837	8,484	175,046	201,367
2009	10,252	6,008	177,796	194,056
2010	22,435	4,826	145,088	172,349
2011	12,407	10,426	148,797	171,630
2012	11,889	5,034	127,555	144,478
2013	3,952	3,996	136,805	144,753
2014	2,407	11,898	163,895	178,200
2015	3,942	10,948	146,859	161,749
2016	6,301	5,352	176,898	188,551
2017	9,212	5,940	263,014	278,166
2018 ^d	7,620	8,228	161,831	177,679
2019	19,009	10,222	219,624	248,855
2020	8,741	^e	162,252	178,000 ^f
2021	1,485	2,850	124,845	129,180
Averages				
2011–2020	8,548	8,005	170,753	187,206
2016–2020	10,177	7,436	196,724	214,250

^a Harvest below Pilot Station sonar includes commercial and subsistence harvest in Statistical Areas 334-11 through 334-19 and 334-21 through 334-23.

^b East Fork Andreafsky River weir escapement count multiplied by 2.

^c Drainagewide run is the sum of harvest below Pilot Station sonar, East Fork Andreafsky weir count doubled, and the Pilot Station sonar count.

^d Preliminary commercial harvest and escapement estimates.

^e East Fork Andreafsky weir did not operate in 2020.

^f An aerial survey was conducted on both the East and West forks for a total count of approximately 843 Chinook. Adding the aerial estimate 843 to harvest below pilot provides a minimum total run of approximately 172,000. The 1995–2019 average contribution of East Fork Andreafsky weir count doubled to total run is 4%. Assuming a 4% (6,500) to account for Andreafsky, the total run is estimated to be approximately 178,000.

Appendix B11.—Chinook salmon escapement counts and percentage of females counted for selected spawning areas in the U.S. (Alaska) portion of the Yukon River drainage, 2001–2021.

	East Fork Andreafsky River weir		Nulato River tower	Henshaw Creek weir		Gisasa River weir		Chena River tower/sonar		Salcha River tower/sonar	
Year	No. fish	% Fem.	No. fish	No. fish	% Fem.	No. fish	% Fem.	No. fish	% Fem. ^a	No. fish	% Fem. ^a
2001	1,148	64	—	1,091	36	3,052	49	9,696	43	13,328	38
2002	4,123 ^b	21	2,696	649	31	2,025	21	6,967 ^c	32	9,000 ^d	35
2003	4,336	48	1,716 ^e	748	39	1,901	38	11,100	45	15,500 ^d	42
2004	8,045	35	—	1,248	23	1,774	34	9,645	63	15,761	63
2005	2,239	50	—	1,059	42	3,111	36	— ^b	42	5,988	54
2006	6,463	44	—	— ^b	—	3,031	29	2,936	46	10,679	43
2007	4,504	45	—	740	43	1,427	41	3,806	40	6,425	36
2008	4,242	39	—	766	27	1,738	15	3,208	44	5,415 ^d	39
2009	3,004	47	—	1,637	54	1,955	28	5,253	55	12,774	39
2010	2,413	49	—	857	49	1,516	30	2,382	31	6,135	33
2011	5,213	20	—	1,796	34	2,692	19	— ^b	32	7,200 ^d	42
2012	2,517	27	—	922	43	1,323	39	2,220 ^d	56	7,165	60
2013	1,998	39	—	772	47	1,126	34	1,859 ^b	40	5,465	50
2014	5,949	48	—	— ^b	—	1,589	19	7,192 ^{b, d}	33	— ^b	32
2015	5,474	40	—	2,391	41	1,319	30	6,294 ^d	55	6,288	43
2016	2,676	49	—	1,354	48	1,395	27	6,665 ^{b, f}	23	2,675 ^{b, c}	39
2017	2,970	26	—	677	42	1,083	28	4,201 ^f	45	4,195 ^c	41
2018	4,114	25	—	—	— ^b	—	—	4,227 ^f	55	4,053 ^f	56
2019	5,111	34	—	438	61	1,328	24	2,018 ^f	—	4,678 ^f	44
2020 ^g	—	—	—	—	—	—	—	—	—	—	—
2021	1,418	37	—	130	35	—	—	1,417	41	2,082	46
SEG ^h	2,100–4,900										
BEG ⁱ								2,800–5,700		3,300–6,500	
Averages											
2001–2020	4,028	39	2,206	1,072	41	1,855	30	5,275	43	7,929	44
2011–2020	4,002	34	NA	1,193	45	1,482	27	4,335	42	5,215	45
2016–2020	3,718	34	NA	823	50	1,269	26	4,278	41	3,900	45
Minimum	1,148	20	1,716	438	23	1,083	15	1,859	23	2,675	32
Maximum	8,045	64	2,696	2,391	61	3,111	49	11,100	63	15,761	63

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Note: Minimum and maximum values exclude the most recent year data. No. = number; Fem. = female. En dashes indicate no survey. NA indicates insufficient data to calculate an average. Sonar was established on the Chena River in 2011 and on the Salcha River in 2016.

- ^a Adjustment factor was applied.
- ^b Incomplete dataset due to environmental factors.
- ^c Mark–recapture population estimate.
- ^d Sonar expansions used when visual counts were prevented by flooding.
- ^e Weir count.
- ^f Final estimate uses a hierarchical run model to extend the season.
- ^g Projects did not operate due to COVID-19 pandemic or funding.
- ^h Sustainable Escapement Goal (SEG).
- ⁱ Biological Escapement Goal (BEG).

Appendix B12.—Estimated run size, escapement, and harvest shares for mainstem Canada-origin Yukon River Chinook salmon, 2001–2021.

Year	Yukon River panel goal or IMEG ^a		Border passage ^b	Total run size ^c	Total allowable catch (TAC)		US share (%) of TAC		US harvest ^d	Canada share (%) of TAC		Midpoint CDN share ^e	Canada harvest	Spawning escapement ^f
	From	To			From	To	74%	80%		20%	26%	23%		
2001	18,000	28,000	62,338	85,663	57,663	67,663	42,671	54,130	23,325	11,533	17,592	14,562	9,774	52,564
2002		28,000	51,428	81,487	53,487	—	39,580	42,790	30,058	10,697	13,907	12,302	9,070	42,359
2003	25,000	28,000	90,040	149,979	121,979	—	90,264	97,583	59,939	24,396	31,715	28,055	9,446	80,594
2004		28,000	59,415	117,247	89,247	—	66,043	71,398	57,832	17,849	23,204	20,527	10,946	48,469
2005		28,000	78,962	123,612	95,612	—	70,753	76,490	44,650	19,122	24,859	21,991	10,977	67,985
2006		28,000	71,388	119,485	91,485	—	67,699	73,188	48,097	18,297	23,786	21,042	8,758	62,630
2007	33,000	43,000	39,698	87,899	44,899	54,899	33,225	43,919	48,201	8,980	14,274	11,627	4,794	34,904
2008		45,000	37,282	62,610	17,610	—	13,031	14,088	25,328	3,522	4,579	4,050	3,399	33,883
2009		45,000	69,575	87,221	42,221	—	31,244	33,777	17,646	8,444	10,977	9,711	4,297	65,278
2010	42,500	55,000	34,470	59,741	4,741	17,241	3,508	13,793	25,271	948	4,483	2,715	2,456	32,014
2011	42,500	55,000	50,901	71,726	16,726	29,226	12,377	23,381	20,825	3,345	7,599	5,472	4,594	46,307
2012	42,500	55,000	34,656	48,494	0	5,994	0	4,795	13,840	1,199	1,558	1,379	2,000	32,656
2013	42,500	55,000	30,573	37,177	0	0	0	0	6,604	0	0	0	1,904	28,669
2014	42,500	55,000	63,431	64,886	9,886	22,386	7,316	17,909	1,455	1,977	5,820	3,899	100	63,331
2015	42,500	55,000	83,674	87,323	32,323	44,823	23,919	35,858	3,649	6,465	11,654	9,059	1,000	82,674
2016	42,500	55,000	71,567	82,765	27,765	40,265	20,546	32,212	11,739	5,553	10,469	8,011	2,769	68,798
2017	42,500	55,000	71,815	93,188	38,188	50,688	28,259	40,550	22,043	7,638	13,179	10,408	3,500	68,315
2018	42,500	55,000	57,264	76,356	21,356	33,856	15,803	27,085	19,266	4,271	8,803	6,537	2,790	54,474
2019	42,500	55,000	44,816	72,620	17,620	30,120	13,039	24,096	27,804	3,524	7,831	5,678	2,764	42,052
2020	42,500	55,000	33,330	45,501	0	3,001	0	2,401	12,171	0	780	390	2,363	30,967
2021	42,500	55,000	31,758	32,972	0	0	0	0	1,214	0	0	0	306	31,452
Averages														
2011–2020			54,203	68,004	16,386	26,036	12,126	20,829	13,940	3,397	6,769	5,083	2,378	51,824
2016–2020			55,758	74,086	20,986	31,586	15,529	25,269	18,605	4,197	8,212	6,205	2,837	52,921

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Year	Border target ^g	Percent of border target achieved ^h	Exploitation rate of Canada stocks ⁱ	Percent taken of maximum harvest share U.S. ^h	Percent taken of maximum harvest share Canada ^h
2001	32,562	1.91	0.39	0.43	0.56
2002	40,302	1.28	0.48	0.70	0.65
2003	53,055	1.70	0.46	0.61	0.30
2004	48,527	1.22	0.59	0.81	0.47
2005	49,991	1.58	0.45	0.58	0.44
2006	49,042	1.46	0.48	0.66	0.37
2007	44,627	0.89	0.60	1.10	0.34
2008	49,050	0.76	0.46	1.80	0.74
2009	54,711	1.27	0.25	0.52	0.39
2010	45,215	0.76	0.46	1.83	0.55
2011	47,972	1.06	0.35	0.89	0.60
2012	43,879	0.79	0.33	2.89	1.28
2013	42,500	0.72	0.23	—	—
2014	46,399	1.37	0.02	0.08	0.02
2015	51,559	1.62	0.05	0.10	0.09
2016	50,511	1.42	0.18	0.36	0.26
2017	52,908	1.36	0.27	0.54	0.27
2018	49,037	1.17	0.29	0.71	0.32
2019	48,178	0.93	0.42	1.15	0.35
2020	42,890	0.78	0.32	5.07	3.03
2021	42,500	0.75	0.05	—	—
Averages					
2011–2020		1.12	0.25	1.31	0.69
2016–2020		1.13	0.30	1.57	0.85

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Note: Total allowable catch (TAC) range is calculated (postseason) by subtracting each end of the goal range from the total run. In season true runs sizes are unknown. These values are estimated in season for management purposes based on proportions of Canada-origin fish passing Pilot Station sonar by the midpoint of the harvest share (23%). Meeting the minimum interim management escapement goal (IMEG) and providing the midpoint of Canada's harvest share of the TAC is part of the US obligation to meet the harvest share objectives. En dashes indicate no data.

- ^a Yukon River Panel goals were not always a range. The current interim management escapement goal (IMEG) began in 2010 and is not a biologically-based escapement goal.
- ^b From 2005 to 2019, border passage estimates are the Chinook salmon estimate of abundance from the sonar at Eagle, minus any Alaska harvest from the community of Eagle upstream of the sonar.
- ^c Total Canada-origin run size is border passage plus Alaska harvest of Canada-origin Chinook salmon. Beginning in 2014, this includes harvest from the Coastal District.
- ^d Since 2004, US Harvest estimates of the Canada stock are estimated by applying the Canada-origin genetic stock proportions collected from harvest sampling to number of fish harvested in Alaska.
- ^e The midpoint is calculated based on the entire escapement goal range. The midpoint of the harvest share is mentioned specifically in the salmon agreement.
- ^f Spawning escapement is the border passage estimate minus the harvest in Canada.
- ^g Border target is the minimum escapement goal plus 23% (the midpoint) of the Canada harvest share.
- ^h Numbers greater than 1 indicate the maximum harvest share was exceeded.
- ⁱ Exploitation rate of the Canada-origin stock is the sum of US and Canada harvest divided by the total run size.

Appendix B13.—Chinook salmon aerial survey indices for selected spawning areas in the Alaska portion of the Yukon River drainage, 2001–2021.

Year	Andreafsky River		Anvik River		Nulato River			Gisasa River
	East Fork	West Fork	Drainagewide Total	Index Area ^a	North Fork ^b	South Fork	Both Forks	
2001	1,059	565	1,420	1,177	1,116	768	1,884 ^d	1,298
2002	1,447	917	1,713	1,329	687	897	1,584	506
2003	1,116 ^c	1,578	973 ^c	973 ^c	— ^c	— ^c	— ^c	— ^c
2004	2,879	1,317	3,679	3,304	856	465	1,321	731
2005	1,715	1,492	2,421	1,922	323	230	553	958
2006	591 ^c	824	1,886	1,776 ^c	620	672	1,292	843
2007	1,758	976	1,650	1,497	1,684	899	2,583	593
2008	278 ^c	262 ^c	992 ^c	827 ^c	415	507	922	487
2009	84 ^c	1,678	832	590	1,418	842	2,260	515
2010	537 ^c	858	974	721	356	355	711	264
2011	620	1,173	642	501	788	613	1,401	906
2012	— ^c	227 ^c	722	451	682	692	1,374	— ^c
2013	1,441	1,090	940	656	586	532	1,118	201 ^c
2014	— ^c	1,695	1,584	800	— ^c	— ^c	— ^c	— ^c
2015	2,167 ^c	1,356 ^c	2,616	— ^c	999	565	1,564	558
2016 ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c
2017	— ^c	942	1,101 ^c	894	500	443	943	— ^c
2018	746	455	1,109	800	438	432	870	452
2019	1,547	904	1,432	1,043	656	485	1,141	— ^c
2020	335	508	675	506	459	403	862	419
2021 ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c
SEG ^f	— ^g	640–1,600	1,100–1,700		— ^d		940–1,900	— ^g
Averages								
2011–2020	938	967	1,215	706	639	521	1,159	584
2016–2020	876	702	1,072	811	513	441	954	436

Note: Aerial survey counts are peak counts only. Survey rating was fair or good unless otherwise noted. En dashes indicate no data.

^a Anvik River index area includes mainstem counts between Yellow River and McDonald Creek.

^b Nulato River mainstem aerial survey counts below the forks are included with the North Fork.

^c Survey was inaccurate or canceled due to poor survey conditions or timing.

^d In 2001, the Nulato River escapement goal was established for both forks combined.

^e Index area includes counts from Beaver Creek to McDonald Creek.

^f Sustainable escapement goal.

^g Aerial escapement goal (2,100–4,900) was discontinued in 2010. Weir-based goal replaced East Fork Andreafsky River aerial survey goal.

Appendix B14.—Chinook salmon escapements for selected spawning areas in the Canada portion of the Yukon River drainage, 2001–2021.

Year	Tincup Creek ^a	Tatchun Creek ^b	Little Salmon River ^a	Big Salmon River ^{a, c}	Nisutlin River ^{a, d}	Ross River ^{a, e}	Wolf River ^{a, f}	Blind Creek	Chandindu River	Big Salmon Sonar	Klondike River Sonar	Teslin River Sonar
2001	39 ^g	—	1,035	1,020	481	—	154	—	129 ^g	—	—	—
2002	—	—	526	1,149	280	—	84	—	— ^h	—	—	—
2003	—	—	1,658	3,075	687	—	292	1,115	185 ⁱ	—	—	—
2004	—	—	1,140	762	330	—	226	792	—	—	—	—
2005	—	—	1,519	952	807	363	260	525	—	5,618	—	—
2006	—	—	1,381	1,140	601	—	114	677	—	7,308	—	—
2007	—	—	451	601	137	—	54	304	—	4,506	—	—
2008	—	—	93	303	—	—	22	276	—	1,431	—	—
2009	—	—	821	1,827	497	—	134	716	—	9,261	5,147	—
2010	—	—	63	656	288	—	94	270	—	3,817	803	—
2011	—	—	38	405	—	—	81	360	—	5,156	1,181	—
2012	—	—	—	—	—	—	—	157	—	2,584	—	3,454 ^j
2013	—	—	—	—	—	—	—	312	—	3,242	—	9,916
2014	—	—	—	—	—	—	—	602	—	6,321	—	17,507
2015	—	—	—	—	—	—	—	964	—	10,078	—	20,463
2016	—	—	—	—	—	—	—	664	—	6,761	—	—
2017	—	—	—	—	—	—	—	— ^k	—	5,672	—	—
2018	—	—	—	—	—	—	—	612	—	5,159	—	—
2019	—	—	—	—	—	—	—	—	—	3,874	—	—
2020	—	—	—	—	—	—	—	—	—	1,635	470	—
2021 ^l	—	15	—	—	—	—	—	—	—	1,958	855	—
IMEG												
Averages												
2001–2020	NA	NA	793	1,081	456	NA	138	556	157	5,151	1,900	15,962
2011–2020	NA	NA	NA	NA	NA	NA	NA	524	NA	5,048	826	15,962
2016–2020	NA	NA	NA	NA	NA	NA	NA	638	NA	4,620	NA	NA

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Year	Whitehorse Fishway		Canada Mainstem		
	Count	Percent hatchery contribution	Border passage estimate ^m	Harvest	Spawning escapement estimate ⁿ
2001	988	36	62,338	9,774	52,559
2002	605	39	51,428	9,070	42,358
2003	1,443	70	90,040	9,446	80,591
2004	1,989	76	59,415	10,946	48,469
2005	2,632	57	78,962	10,977	67,985
2006	1,720	47	71,388	8,758	62,630
2007	427	56	39,698	4,794	34,904
2008	399	54	37,282	3,399	33,630
2009	828	47	69,575	4,297	65,278
2010	672	49	34,470	2,456	32,009
2011	1,534	48	50,901	4,594	46,307
2012	1,030	59	34,656	2,000	32,656
2013	1,139	67	30,573	1,904	28,669
2014	1,601	78	63,431	100	63,331
2015	1,465	60	83,674	1,000	82,674
2016	1,556	42	71,567	2,769	68,798
2017	1,226	39	71,815	3,500	68,315
2018	691	37	57,264	2,790	54,474
2019	282	13	44,816	2,764	42,052
2020	216	24	33,330	2,363	30,967
2021	274	36	31,758	306	31,452
IMEG					42,500–55,000 ^o
Averages					
2001–2020	1,122	50	56,831	4,885	51,933
2011–2020	1,074	47	54,203	2,378	51,824
2016–2020	794	31	55,758	2,837	52,921

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Note: En dashes (–) = no data. NA indicates insufficient data to generate an average.

- ^a Data obtained by aerial survey unless otherwise noted. Only peak counts are listed. Survey rating is fair to good, unless otherwise noted.
- ^b Historical data were obtained by foot surveys prior to 1997. Data from 1997–2000 and 2021 were from weir counts.
- ^c Counts are from the mainstem Big Salmon River between Big Salmon Lake and the vicinity of Slouch Creek.
- ^d One Hundred Mile Creek to Sidney Creek.
- ^e Big Timber Creek to Lewis Lake.
- ^f Wolf Lake to Fish Lake outlet except where otherwise indicated.
- ^g Foot survey.
- ^h Resistance board weir tested for 3 weeks.
- ⁱ Combination resistance board weir and conduit weir tested and operational from July 10–30.
- ^j No Chinook salmon counted on the left bank due to high water; estimate should be considered a minimum.
- ^k Did not operate due to high water.
- ^l Data are preliminary.
- ^m Estimated total border passage excluding Porcupine River based on 3-area index (Little Salmon, Big Salmon, and Nisutlin Rivers aerial survey) plus Canada harvest from 1982–2001, on radio tagging proportion study from 2002–2004, and on Eagle sonar for 2005–2017.
- ⁿ Estimated total spawning escapement excluding Porcupine River based on 3-area index for 1982–2001, and on border passage estimate minus Canada harvest for 2002–2015.
- ^o Interim management escapement goal (IMEG) range of 42,500–55,000 was established in 2010.

Appendix B15.—Summer chum salmon escapements for selected spawning areas in the Alaska portion of the Yukon River drainage, 2001–2021.

Year	Andreafsky River			Anvik River	Rodo River	Kaltag Creek	Nulato River		
	East Fork		West Fork	Sonar	Aerial ^b	Tower	South Fork	North Fork ^a	Mainstem
	Aerial ^b	Weir	Aerial ^b				Aerial ^b	Aerial ^b	Tower
2001	—	2,134 ^c	—	224,059	—	—	—	—	—
2002	—	44,194	—	459,058	—	13,583	—	—	72,232
2003	—	22,461	—	256,920	—	3,056	—	—	19,590 ^c
2004	—	64,883	—	365,354	—	5,247	—	—	—
2005	—	20,127	—	525,392	—	22,093	—	—	—
2006	3,100 ^c	102,260	617	605,487	—	—	7,772	11,658	—
2007	—	69,642	—	459,038	—	—	21,825	15,277	—
2008	9,300	57,259	25,850	374,933	—	—	12,070	10,715	—
2009	736	8,770	3,877	193,098	621	—	2,120	567	—
2010	1,982	72,893	24,380	396,174	—	—	1,891	1,038	—
2011	12,889	100,473	10,020	642,529	6,011	—	9,454	8,493	—
2012	— ^c	56,680	— ^c	484,091	15,606	—	20,600	14,948	—
2013	10,965	61,234	9,685	577,876	—	—	13,695	13,230	—
2014	—	37,793	9,650	399,796	—	—	—	—	—
2015	6,004 ^c	48,809	2,837 ^c	374,968	3,685	—	4,102	9,525	—
2016	—	50,362	—	337,821	—	—	—	—	—
2017	—	55,532	11,655	415,139	—	—	4,890	7,882	—
2018	16,206	36,330	13,837	305,098	—	—	3,930	1,164	—
2019	26,048	49,881	17,198	249,014	—	—	2,612	4,898	—
2020	10,628	—	9,932	—	—	—	861	722	—
2021	—	2,531	—	18,819	—	—	—	—	—
Escapement objective		>40,000 ^d		350,000–700,000 ^e					
Averages									
2001–2020	11,094	53,310	12,427	402,413	6,481	10,995	8,140	7,701	45,911
2011–2020	15,347	55,233	11,711	420,704	8,434	NA	7,518	7,608	NA
2016–2020	17,627	48,026	13,156	326,768	NA	NA	3,073	3,667	NA

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Year	Henshaw Creek	Gisasa River		Hogatza River		Tozitna River	Chena River		Salcha River	
	Weir	Aerial ^b	Weir	Clear and Caribou Creeks		Weir and aerial ^b	Aerial ^b	Tower	Aerial ^b	Tower
				Aerial ^b	Tower					
2001	34,777	—	17,946	—	3,674	12,527	2	4,773	—	14,900
2002	25,249	—	33,481	—	13,150	18,789	—	1,021 ^c	78	27,012 ^c
2003	21,400	—	25,999	—	6,159	8,487	—	573 ^c	—	—
2004	86,474	—	37,851	—	15,661	25,003	—	15,163 ^c	—	47,861
2005	237,481	—	172,259	—	26,420	39,700	219	16,873 ^c	4,320	194,933
2006	—	1,000	261,306	—	29,166 ^f	22,629	469	35,109 ^c	152	113,960
2007	44,425	—	46,257	—	6,029 ^f	8,470	—	4,999	4 ^c	13,069
2008	96,731	20,470	36,938	—	—	9,133	37	1,300 ^c	—	2,213 ^c
2009	156,933	1,060	25,904	3,981 ^g	—	8,434	—	16,516	—	31,035
2010	105,398	1,096	47,669	840 ^g	—	—	—	7,561	—	22,185
2011	248,247	13,228	95,796	3,665 ^g	—	11,351	4,600	— ^c	1,154	66,564 ^h
2012	292,082	—	83,423	23,022 ^g	—	11,045	1,180	6,882 ^h	— ^c	46,252
2013	285,008	9,300 ^c	80,055	—	— ^c	—	135 ^c	21,372	— ^c	60,981
2014	— ^c	—	32,523	—	—	—	1,317	13,303 ⁱ	1,993 ^c	— ^c
2015	238,529	5,601	42,747	6,080	—	—	—	8,620 ⁱ	0 ^c	12,812 ⁱ
2016	286,780	—	66,670	—	—	—	—	6,493 ⁱ	—	2,897 ⁱ
2017	360,687	—	73,584	—	—	—	—	21,156 ⁱ	—	29,093 ⁱ
2018	— ^d	8,058	—	3,307	—	—	—	13,084 ^c	—	22,782 ^c
2019	34,342	—	19,099	—	—	—	—	2,704 ^c	—	2,117 ^c
2020	—	754	—	—	—	—	—	357 ^j	—	—
2021	3,729	—	—	—	—	—	—	578	—	2,193
Escapement objective										
Averages										
2001–2020	159,659	6,408	66,639	6,816	14,323	15,961	1,118	9,832	1,539	45,429
2011–2020	249,382	6,910	61,737	9,019	NA	11,198	2,366	10,441	1,574	30,437
2016–2020	227,270	4,406	53,118	NA	NA	NA	NA	8,759	NA	14,222

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Note: En dashes (–) = no data. Averages were not calculated at projects with incomplete years of collection. NA indicates insufficient data to generate an average.

- ^a Includes mainstem counts below the confluence of the North and South Forks, unless otherwise noted.
- ^b Aerial survey counts are peak counts only; survey rating is fair or good unless otherwise noted.
- ^c Incomplete survey due to environmental conditions.
- ^d Sustainable Escapement Goal established by the Alaska Board of Fisheries, January 2010.
- ^e Biological escapement goal established by the Alaska Board of Fisheries, 2005.
- ^f Project operated as a video monitoring system on Clear Creek. Video was also conducted on Caribou Creek from 2004–2007 (15,345, 14,605, 24,039, and 17,728, respectively).
- ^g Consists of Clear Creek only.
- ^h Estimate includes an expansion for missed counting days based on using 2 DIDSON sonars to assess chum salmon passage.
- ⁱ Due to high water, DIDSON sonar was used and preliminary species apportionment was estimated using average run timing.
- ^j Total escapement could not be determined. Sonar operated 17 days due to flooding and debris.

Appendix B16.–Yukon River summer chum salmon drainagewide run size, 2001–2021.

Year	Harvest below Pilot Station sonar ^a	Total Andreafsky River ^b	Pilot Station sonar	Drainagewide run ^c	Estimated escapement ^d	Escapement goal ^e	
						Lower	Upper
2001	61,388	4,268	442,546	508,202	435,819		
2002	69,482	88,388	1,097,769	1,255,639	1,154,229		
2003	55,574	44,922	1,183,009	1,283,505	1,188,643		
2004	71,771	129,766	1,344,213	1,545,750	1,440,755		
2005	94,925	40,254	2,570,696	2,705,875	2,570,631		
2006	120,515	204,520	3,780,760	4,105,795	3,897,300		
2007	230,816	139,284	1,875,491	2,245,591	1,954,025		
2008	175,818	114,518	1,849,553	2,139,889	1,901,600		
2009	208,918	17,540	1,477,186	1,703,644	1,452,351		
2010	218,285	145,786	1,415,027	1,779,098	1,456,335		
2011	294,790	200,946	2,051,501	2,547,237	2,175,323		
2012	283,884	113,360	2,136,476	2,533,720	2,084,149		
2013	427,319	122,468	2,849,683	3,399,470	2,794,904		
2014	428,853	75,586	2,020,309	2,524,748	1,906,595		
2015	371,326	97,618	1,591,505	2,060,449	1,615,118		
2016	522,431	100,724	1,921,748	2,544,903	1,930,196	500,000	1,200,000
2017	444,779	111,064	3,093,735	3,649,578	3,003,182	500,000	1,200,000
2018 ^f	439,305	72,660	1,612,688	2,124,653	1,469,290	500,000	1,200,000
2019 ^f	265,646	99,762	1,402,925	1,768,333	1,477,381	500,000	1,200,000
2020	46,368	^g	692,602	781,000 ^h	723,675	500,000	1,200,000
2021	1,149	5,268	153,718	160,135	158,869	500,000	1,200,000
Averages							
2011–2020	352,470	110,465	1,937,317	2,393,409	1,917,981		
2016–2020	343,706	96,053	1,744,740	2,173,693	1,720,745		

^a Harvest below Pilot Station sonar includes subsistence harvest in the communities of Hooper Bay, Scammon Bay, Nunam Iqua, Alakanuk, Emmonak, Kotlik, Mountain Village, Pitkas Point, Saint Mary's, and Pilot Station and commercial harvest from statistical area codes 334-11 through 334-19 and 334-21 through 334-23.

^b East Fork Andreafsky River weir escapement count multiplied by 2.

^c Drainagewide run is the sum of harvest below Pilot Station sonar, East Fork Andreafsky weir count doubled, and the Pilot Station sonar count.

^d Estimates escapement is the drainagewide run minus all harvest in the drainage.

^e Drainagewide biological escapement goal (BEG) for summer chum was adopted in 2016 (Liller and Savereide 2018).

^f Preliminary commercial harvest and escapement estimates.

^g East Fork Andreafsky weir did not operate in 2020.

^h An aerial survey was conducted on both the East and West forks of the Andreafsky River for a total count of approximately 20,500 summer chum. Adding the aerial estimate of 20,500 to harvest below pilot provides a minimum total run of approximately 760,000. The 1995–2019 average contribution of EF Andreafsky weir count doubled to total run is 5%. Assuming a 5% (42,000) to account for Andreafsky, the total run is estimated to be approximately 781,000.

Appendix B17.—Yukon River fall chum salmon estimated brood year production and return per spawner estimates 1974–2021.

Year	(P) Escapement ^b	Estimated annual totals Catch Run		Estimated brood year return								(R)	(R/P)
				Number of salmon ^a				Proportion				Total brood year return ^a	Return/ spawner
				Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6		
1974	671,600	478,875	1,150,475	111,941	649,758	98,222	0	0.13	0.76	0.11	0.00	859,921	1.28
1975	2,289,000	473,062	2,762,062	196,395	1,752,220	66,194	0	0.10	0.87	0.03	0.00	2,014,809	0.88
1976	545,700	339,043	884,743	145,935	633,337	137,437	4,780	0.16	0.69	0.15	0.01	921,489	1.69
1977	726,700	447,918	1,174,618	110,674	1,072,744	191,801	6,301	0.08	0.78	0.14	0.00	1,381,521	1.90
1978	550,900	434,030	984,930	22,112	366,655	106,028	0	0.04	0.74	0.21	0.00	494,795	0.90
1979	1,381,000	615,377	1,996,377	44,039	899,410	306,719	4,214	0.04	0.72	0.24	0.00	1,254,382	0.91
1980	321,900	488,305	810,205	13,527	405,881	199,289	2,812	0.02	0.65	0.32	0.00	621,509	1.93
1981	548,800	683,493	1,232,293	51,122	992,599	334,849	8,938	0.04	0.72	0.24	0.01	1,387,507	2.53
1982	234,100	373,175	607,275	12,378	488,757	173,213	769	0.02	0.72	0.26	0.00	675,117	2.88
1983	500,250	525,016	1,025,266	15,011	935,830	229,435	3,995	0.01	0.79	0.19	0.00	1,184,271	2.37
1984	351,400	412,322	763,722	6,584	420,144	160,931	8,978	0.01	0.70	0.27	0.02	596,637	1.70
1985	693,000	515,481	1,208,481	46,799	907,658	300,006	2,593	0.04	0.72	0.24	0.00	1,257,055	1.81
1986	523,400	318,028	841,428	1,438	514,782	338,977	5,584	0.00	0.60	0.39	0.01	860,781	1.64
1987	718,200	406,365	1,124,565	11,947	674,142	340,136	7,557	0.01	0.65	0.33	0.01	1,033,782	1.44
1988	341,200	355,947	697,147	12,085	207,914	158,085	33,443 ^c	0.03	0.51	0.38	0.08	411,528	1.21
1989	528,700	545,322	1,074,022	3,218	296,426	412,466 ^c	20,937	0.00	0.40	0.56	0.03	733,045	1.39
1990	483,450	352,264	835,714	667	668,863 ^c	456,441	33,267	0.00	0.58	0.39	0.03	1,159,238	2.40
1991	588,700	439,096	1,027,796	0 ^c	1,129,308	398,114	12,981	0.00	0.73	0.26	0.01	1,540,403	2.62
1992	407,800	149,052	556,852	7,848	699,151	206,950	4,106	0.01	0.76	0.23	0.00	918,056	2.25
1993	371,600	91,135	462,735	9,883	480,712	107,485	3,235	0.02	0.80	0.18	0.01	601,315	1.62
1994	945,200	169,572	1,114,772	4,536	236,381	148,145	2,502 ^c	0.01	0.60	0.38	0.01	391,564	0.41
1995	1,153,000	461,534	1,614,534	2,485	264,683	72,570 ^c	417	0.01	0.78	0.21	0.00	340,156	0.30
1996	879,100	261,315	1,140,415	417	172,667 ^c	129,263	8,339	0.00	0.56	0.42	0.03	310,686	0.35
1997	535,100	170,079	705,179	2,502 ^c	242,268	119,056	3,634	0.01	0.66	0.32	0.01	367,459	0.69
1998	279,600	70,857	350,457	437	269,931	59,828	6,302	0.00	0.80	0.18	0.02	336,499	1.20
1999	285,100	131,380	416,480	29,143	719,861	195,476	17,239	0.03	0.75	0.20	0.02	961,719	3.37
2000	221,600	28,642	250,242	9,052	319,947	114,613	0	0.02	0.72	0.26	0.00	443,612	2.00
2001	326,800	45,585	372,385	130,891	2,056,636	720,124	34,781	0.04	0.70	0.24	0.01	2,942,432	9.00

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Year	(P) Escapement ^b	Estimated annual totals Catch Run		Estimated brood year return								(R)	(R/P)
				Number of salmon ^a				Proportion				Total brood year return ^a	Return/ spawner
				Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6		
2002	398,700	27,769	426,469	0	465,507	250,500	15,228	0.00	0.64	0.34	0.02	731,235	1.83
2003	713,150	79,225	792,375	27,642	875,820	477,686	17,778	0.02	0.63	0.34	0.01	1398926	1.96
2004	576,000	76,616	652,616	0	362,469	153,436	2,519	0.00	0.70	0.30	0.00	518,424	0.90
2005	1,898,000	290,488	2,188,488	2,437	393,354	92,116	3,912	0.00	0.80	0.19	0.01	491,818	0.26
2006	942,600	270,673	1,213,273	26,509	396,210	361,308	30,629 ^d	0.03	0.49	0.44	0.04	814,655	0.86
2007	955,200	205,901	1,161,101	94,946	866,455	189,211 ^d	9,094	0.08	0.75	0.16	0.01	1,159,707	1.21
2008	639,450	218,369	857,819	12,466	857,376 ^d	415,894	9,495	0.01	0.66	0.32	0.01	1,295,232	2.03
2009	497,600	93,477	591,077	11,984 ^d	788,517	426,860	22,748	0.01	0.63	0.34	0.02	1,250,109	2.51
2010	505,600	80,191	585,791	2,303	497,316	247,109	9,175	0.00	0.66	0.33	0.01	755,903	1.50
2011	916,450	327,691	1,244,141	22,998	489,135	182,134	1,797	0.03	0.70	0.26	0.00	696,064	0.76
2012	692,600	396,600	1,089,200	69,462	1,169,894	332,334	5,653	0.04	0.74	0.21	0.00	1,577,342	2.28
2013	857,700	358,109	1,215,809	29,126	1,923,980	319,216	3,237	0.01	0.85	0.14	0.00	2,275,559	2.65
2014	743,200	213,469	956,669	57,773	760,050	126,832	2,483	0.06	0.80	0.13	0.00	947,138	1.27
2015	545,800	282,653	828,453	29,765	664,836	86,658	430 ^d	0.04	0.85	0.11	0.00	781,689	1.43
2016	833,500	556,829	1,390,329	8,059	89,521	6,437 ^d	1,445	0.08	0.85	0.06	NA	105,461	~0.13 ^e
2017	1,733,500	582,383	2,315,883	5,571	87,443 ^d	29,927	NA	NA	NA	NA	NA	122,941	~0.07 ^f
2018	656,150	458,534	1,114,684	940 ^d	NA	NA	NA	NA	NA	NA	NA	NA	NA
2019	529,300	273,664	802,964	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2020	178,400	5,833	184,233	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2021	94,525	724	95,249	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average-20	685,443	310,229	995,671										
Min-15	221,600	27,769	250,242	0	172,667	59,828	0	0.00	0.40	0.03	0.00	310,686	0.26
Max-15	2,289,000	683,493	2,762,062	196,395	2,056,636	720,124	34,781	0.16	0.87	0.56	0.08	2,942,432	9.00
	673,451	All brood years (1974–2015)		33,107	690,228	236,742	8,854	0.03	0.70	0.26	0.01	968,931	1.77
	535,957	Even brood years (1974–2015)		24,641	503,000	208,326	8,860	0.03	0.67	0.29	0.01	744,827	1.55
	810,945	Odd brood years (1974–2015)		41,572	877,457	265,158	8,848	0.03	0.73	0.24	0.01	1,193,035	1.98

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Note: Minimum (“Min-15”) and maximum (“Max-15”) indicate the lowest and highest values for each year presented through 2015. “Average-20” value is the average through the year 2020. Current brood year data are preliminary as are 2017 to 2021 harvest estimates. Drainagewide escapement back to 1974 is based on Bayesian analysis which began in 2014.

- ^a The estimated number of salmon which returned are based upon annual age composition observed in Lower Yukon Test Fishery gillnets each year, weighted by test fish catch per unit effort.
- ^b Contrast in escapement data is 10.33.
- ^c Based upon expanded test fishery age composition estimates for years in which the test fishery terminated early both in 1994 and 2000.
- ^d Combination of Mt. Village test fishery weighted ages with Lower Yukon Test Fishery to bolster sample sizes.
- ^e Brood year return for 3-, 4-, and 5-year fish indicate that production (R/P, return per spawner) from brood year 2016 was approximately 0.13. Recruits estimated for incomplete brood year, denoted by shaded values.
- ^f Brood year return for 3- and 4-year fish, indicate that production (R/P) from brood year 2017 was approximately 0.07. Recruits estimated for incomplete brood year, denoted by shaded values.

Appendix B18.—Fall chum salmon abundance estimates or escapement estimates for selected spawning areas in Alaska portions of the Yukon River drainage, 2001–2021.

Year	Yukon River mainstem sonar estimate	Alaska						
		Tanana River Drainage					Upper Yukon River Drainage	
		Toklat River ^a	Kantishna River abundance estimate ^b	Delta River ^c	Bluff Cabin Slough ^d	Upper Tanana River abundance estimate ^e	Teedriinjik River ^f	Sheenjek River ^g
2001	408,961	6,007 ^h	22,992	8,103	1,808	96,556 ⁱ	112,664	53,932
2002	367,886	28,519	56,665	11,992	3,116 ^j	109,961	94,472	31,642
2003	923,540	21,492	87,359	22,582	10,600	193,418	221,343	44,047 ^k
2004	633,368	35,480	76,163	25,073	10,270	123,879	169,848	37,878
2005	1,894,078	17,779 ^l	107,719	28,132	11,964	337,755	526,838	485,886 ^{m, n}
2006	964,238	—	71,135	14,055	—	202,669	254,778	175,620 ^{m, n}
2007	740,195	—	81,843	18,610	—	320,811	243,805	69,184 ^{m, n}
2008	636,525	—	—	23,055	1,198 ^j	—	178,278	50,348 ^{m, n}
2009	274,227 ^o	—	—	13,492	2,900	—	—	54,126 ^{m, n}
2010	458,103	—	—	17,993	1,610	—	167,532	24,669
2011	873,877	—	—	23,639	2,655	—	298,223	97,976 ^{m, n}
2012	778,158	—	—	9,377 ^h	—	—	205,791	104,701 ^{m, n}
2013	865,295	9,161 ^d	—	31,955	5,554	—	252,710	—
2014	706,630	—	—	32,480 ^j	4,095	—	221,421	—
2015	669,483	8,422 ^d	—	33,401 ^j	6,020	—	164,486	—
2016	994,760	16,885 ^d	—	21,913 ^j	4,936	—	295,023	—
2017	1,829,931	—	—	48,783 ^j	—	—	509,115	—
2018	928,664	25,587 ^d	—	39,641 ^j	5,822	—	170,356	—
2019	842,041	—	—	51,748 ^j	4,664	—	116,323	—
2020	262,439	1,328 ^d	—	9,854 ^j	1,124	—	—	—
2021 ^p	146,197	—	—	1,613	1,085	—	21,162	—
Escapement objective ^q	300,000 ^r 600,000	15,000 ^s 33,000		7,000 20,000		46,000 ^s 103,000	85,000 234,000	50,000 ^s 104,000
Averages								
2001–2020	830,430 ^t	17,066	65,666	24,294	4,896	177,487	233,500	102,501
2011–2020	875,128	12,277	NA	30,279	4,359	NA	248,161	101,339
2016–2020	971,567	14,600	NA	34,388	4,137	NA	272,704	NA

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Note: En dashes (–) = no data. Yukon River mainstem sonar historical estimates were revised in 2016, using selectivity parameters. NA indicates insufficient data to generate an average.

- ^a Expanded total abundance estimates for upper Toklat River index area using stream life curve (SLC) developed with 1987–1993 data. Index area includes Geiger Creek, Sushana River, and mainstem floodplain sloughs from approximately 0.25 mile upstream of roadhouse, unless otherwise indicated.
- ^b Fall chum salmon abundance estimate for the Kantishna and Toklat River drainages is based on a mark–recapture program.
- ^c Population estimate generated from replicate foot surveys and stream life data (area under the curve method), unless otherwise noted.
- ^d Aerial survey count, unless otherwise indicated.
- ^e Fall chum salmon abundance estimate for the upper Tanana River drainage is based on a mark–recapture program. Upper Tanana River consists of that portion upstream of the confluences with the Kantishna River.
- ^f Split-beam sonar estimate 1995–2006, DIDSON sonar since 2007. Project was aborted or did not operate in 2009 and 2020. Sonar counts were expanded to represent the remainder of the run after the project was terminated for the season.
- ^g Single-beam sonar estimate beginning in 1981, split-beam sonar estimate 2002 to 2004, DIDSON from 2005 to 2012. Sonar counts were expanded to represent the remainder of the run after the project was terminated for the season.
- ^h Minimal estimate because Sushana River was breached by the main channel and uncountable.
- ⁱ Low numbers of tags deployed and recovered resulted in an estimate with an extremely large confidence interval (SE = 20,955).
- ^j Peak foot survey count. May include peak counts by river channels.
- ^k Project ended on peak daily passages due to late run timing, estimate was expanded based on run timing (87%) at Rampart.
- ^l Minimal estimate because of late timing of ground surveys with respect to peak of spawning.
- ^m Sonar counts include both banks in 1985–1987, 2005–2009, and 2011–2012.
- ⁿ In addition to the historical right bank count, the left bank was enumerated with DIDSON. Right bank counts were: 2005 (266,963), 2006 (106,397), 2007 (39,548), 2008 (35,912), 2009 (28,480), 2011 (49,080) and 2012 (57,823). Not included are end of season expansions, used to compare to the escapement goal.
- ^o Mainstem Yukon River sonar project (located near Pilot Station) encountered record low water levels during the fall season causing difficulties with species apportionment and catchability. Fall chum salmon estimate is probably conservative and should not be used in averages or run reconstructions.
- ^p Data are preliminary.
- ^q Escapement objectives include historical tributary project biological escapement goals (BEGs) and current project and drainagewide sustainable escapement goals (SEGs).
- ^r Drainagewide escapement goal is related to mainstem passage estimate based on the sonar near Pilot Station minus upriver harvest.
- ^s Escapement goals discontinued in 2010 for Toklat River, 2016 for Sheenjek River, and 2019 for Tanana River (upper Tanana plus Toklat).
- ^t Does not include 2009.

Appendix B19.–Fall chum salmon abundance estimates or escapement estimates for selected spawning areas in Canada portions of the Yukon River drainage, 2001–2021.

Year	Porcupine Drainage		Mainstem Yukon River Index ^b	Kluane River ^{b, c}	Teslin River ^{b, d}	Canada Mainstem			
	Fishing Branch River ^a	Porcupine River sonar				Border passage estimate ^e	Harvest	Spawning escapement estimate ^f	
2001	21,737	–	2,453	4,884	5	38,769 ^g	5,278	33,491	
2002	13,636	–	973	7,147	64	104,853 ^g	6,232	98,621	
2003	29,713	–	7,982	39,347	390	153,656 ^g	10,523	143,133	
2004	20,417	–	3,440	18,982	167	163,625 ^g	9,545	154,080	
2005	119,058	–	16,425	34,600	585	451,477	13,979	437,498	
2006	30,954	–	6,553	18,208	620	227,515 ^h	6,617	220,898	
2007	32,150	–	–	–	–	246,317 ^h	9,330	236,987	
2008	19,086 ⁱ	–	–	–	–	174,028 ^h	6,130	167,898	
2009	25,828	–	–	–	–	94,739	1,113	93,626	
2010	15,413	–	–	–	–	121,498	3,709	117,789	
2011	13,085 ⁱ	–	–	–	–	211,878	6,312	205,566	
2012	22,399	–	–	–	–	141,567	3,905	137,662	
2013	– ^j	35,615	–	–	–	204,149	3,887	200,262	
2014	– ^j	17,756	–	–	–	159,846	3,050	156,796	
2015	8,351	21,396	–	–	–	112,555	3,897	108,658	
2016	29,397	54,395	–	–	–	148,012	2,745	145,267	
2017	48,524	67,818	–	16,265	–	404,989	3,404	401,585	
2018	10,151	–	–	1,734	–	157,083	2,826	154,257	
2019	18,171	27,447	–	928	–	102,497	2,759	99,738	
2020	4,795	–	323	120	–	23,512	0	23,512	
2021 ^k	2,413	3,486	1,131	64	–	23,170	0	23,170	
Escapement objective ^l	50,000–120,000							>80,000	
IMEG	22,000–49,000 ^m							70,000–104,000 ⁿ	
Averages									
2001–2020	26,826	NA	5,450	14,222	291	181,188	5,262	166,866	
2011–2020	19,359	37,405	NA	NA	NA	166,609	3,279	163,330	
2016–2020	22,208	49,887	NA	6,309	NA	167,219	2,347	164,872	

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Note: En dashes (–) = no data. NA indicates insufficient data to generate an average.

- ^a Weir counts with expansions through October 25, unless otherwise indicated.
- ^b Aerial survey count, unless otherwise indicated.
- ^c Index area includes Duke River to end of spawning sloughs below Swede Johnston Creek.
- ^d Index area includes Boswell Creek area (5 km below to 5 km above confluence).
- ^e Border passage estimate is based on mark–recapture from 1980–2005, 2006 to present is based on sonar minus harvest from Eagle residents upstream of deployment.
- ^f Excludes Fishing Branch River escapement (estimated border passage minus Canada mainstem harvest).
- ^g 1999 to 2004 border passage estimates were revised using a stratified SPAS analysis.
- ^h Mark–recapture border passage yearly estimates include 2006 (217,810), 2007 (235,956), and 2008 (132,048) during transition to sonar.
- ⁱ Incomplete count caused by late installation or early removal of project or high-water events.
- ^j Fishing Branch River weir did not operate, estimates based on radio telemetry resulted in Canada estimates of 25,376 in 2013 and 7,304 in 2014.
- ^k Preliminary data.
- ^l Escapement objective based on U.S./Canada Treaty Obligations, some years stabilization or rebuilding goals are applied.
- ^m Interim management escapement goal (IMEG) established for 2008–2010 based on percentile method and carried forward.
- ⁿ Interim management escapement goal (IMEG) established for 2010 based on brood table of Canada-origin mainstem stocks (1982 to 2003).

Appendix B20.—Coho salmon passage estimates or escapement estimates for selected spawning areas in the Alaska portion of the Yukon River drainage, 2001–2021.

	Yukon River mainstem sonar estimate ^a	Nenana River Drainage						Upper Tanana River Drainage					
Year		Lost Slough	Nenana mainstem ^b	Wood Creek	Seventeen Mile Slough	Delta Clearwater River ^c	Clearwater Lake and Outlet	Richardson Clearwater River					
2001	160,272	242 (h)	859 (h)	699 (h)	3,753 (h)	46,985 (b)	4,425 (b)	1,531 (f)					
2002	137,077	0 (h)	328 (h)	935 (h)	1,910 (h)	38,625 (b)	5,900 (b)	874 (f)					
2003	280,552	85 (h)	658 (h)	3,055 (h)	4,535 (h)	102,800 (b)	8,800 (b)	6,232 (h)					
2004	207,844	220 (h)	450 (h)	840 (h)	3,370 (h)	37,550 (b)	2,925 (b)	8,626 (h)					
2005	194,622	430 (h)	325 (h)	1,030 (h)	3,890 (h)	34,293 (b)	2,100 (b)	2,024 (h)					
2006	163,889	194 (h)	160 (h)	634 (h)	1,916 (h)	16,748 (b)	4,375 (b)	271 (h)					
2007	192,406	63 (h)	520 (h)	605 (h)	1,733 (h)	14,650 (b)	2,075 (b)	553 (h)					
2008	145,378	1,342 (h)	1,539 (h)	578 (h)	1,652 (h)	7,500 (b)	1,275 (b)	265 (h)					
2009	240,779 ^d	410 (h)	–	470 (h)	680 (h)	16,850 (b)	5,450 (b)	155 (h)					
2010	177,724	1,110 (h)	280 (h)	340 (h)	720 (h)	5,867 (b)	813 (b)	1,002 (h)					
2011	149,533	369 (h)	–	–	912 (h)	6,180 (b)	2,092 (b)	575 (h)					
2012	130,734	–	106 (h)	–	405 (h)	5,230 (b)	396 (h)	515 (h)					
2013	110,515	721 (h)	–	55 (h)	425 (h)	6,222 (b)	2,221 (h)	647 (h)					
2014	283,421	333 (h)	378 (h)	649 (h)	886 (h)	4,285 (b)	434 (h)	1,941 (h)					
2015	121,193	242 (h)	1,789 (h)	1,419 (h)	3,890 (h)	19,533 (b)	1,621 (h)	3,742 (h)					
2016	168,297	334 (h)	1,680 (h)	1,327 (h)	2,746 (h)	6,767 (b)	1,421 (h)	1,350 (h)					
2017	166,320	1,278 (h)	862 (h)	2,025 (h)	1,942 (h)	9,617 (b)	–	–					
2018	136,347	1,822 (h)	241 (h)	361 (h)	347 (h)	2,884 (b)	2,465 (h)	976 (h)					
2019	86,401	–	749 (h)	184 (h)	424 (h)	2,043 (b)	258 (h)	300 (h)					
2020	107,680	28 (h)	206 (h)	231 (h)	507 (h)	2,557 (b)	210 (h)	475 (h)					
2021 ^e	37,255	126 (h)	104 (h)	226 (h)	213 (h)	913 (b)	130 (h)	17 (h)					
SEG ^f		5,200–17,000											
Averages													
2001–2020	164,221 ^f	512	655	858	1,832	19,359	2,592	1,687					
2011–2020	146,044	641	859	867	1,457	7,256	1,495	1,387					
2016–2020	133,009	866	747	986	1,386	5,456	1,365	934					

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Note: En dashes (–) = no data. Only peak counts presented. Survey rating is fair to good, unless otherwise noted. Denotations of survey methods include: (b) = boat, (f) = fixed wing, (g) = ground/foot, (h) = helicopter, and (u) = undocumented.

- ^a Passage estimates for coho salmon are incomplete. The sonar project is terminated prior to the end of the coho salmon run. Yukon River mainstem sonar historical estimates were revised in 2016, using new selectivity parameters.
- ^b Index area includes mainstem Nenana River between confluences of Lost Slough and Teklanika River.
- ^c Index area is lower 17.5 miles of system surveys conducted generally during the period October 21 through 27 (November 7, 2018).
- ^d Pilot Station sonar project encountered record low water levels during the fall season causing difficulties with species apportionment and catchability. Coho salmon are suspected of being overestimated therefore this value should not be used in averages or run reconstructions.
- ^e Data are preliminary.
- ^f Sustainable escapement goal (SEG) established January 2004, (replaced BEG of greater than 9,000 fish established March 1993).

Appendix B21.—Index of coho salmon run size minus estimated total Yukon River harvest provides an estimate of escapement upstream of the mainstem Yukon River sonar operated near Pilot Station, 1995–2021.

Year	Coho salmon reconstruction index ^a	Total Yukon harvest	Estimated escapement
1995	199,551	77,787	121,764
1996 ^b	—	—	—
1997	197,883	61,883	136,000
1998	154,560	19,103	135,457
1999	143,457	23,584	119,873
2000	208,918	15,530	193,388
2001	186,751	23,404	163,347
2002	182,391	17,076	165,315
2003	307,672	51,671	256,001
2004	296,423	43,063	253,360
2005	261,861	86,306	175,555
2006	309,275	86,039	223,236
2007	284,304	65,433	218,871
2008	181,154	52,937	128,217
2009 ^c	—	—	—
2010	188,372	18,905	169,467
2011	243,795	89,405	154,390
2012	216,839	96,602	120,237
2013	163,768	81,032	82,736
2014	388,971	123,952	265,019
2015	255,541	148,553	106,988
2016	397,643	211,244	186,399
2017 ^d	315,247	147,821	167,426
2018 ^d	259,847	116,862	142,985
2019 ^d	169,586	64,589	104,997
2020 ^d	120,456	2,418	118,038
2021 ^d	45,540	293	45,247
Average-20	234,761	71,883	162,878
Minimum-20	120,456	2,418	82,736
Maximum-20	397,643	211,244	265,019

Note: Median, minimum, and maximum indicate the median, lowest, and highest values and exclude the most recent year data.
En dashes (—) = no data.

^a Does not include escapements to systems downstream of Yukon River mile 123 including the Andreafsky River. A weir counted coho salmon in the East Fork Andreafsky from 1995 to 2005 with escapement ranging from 3,000 to 16,000 with an average of 8,000 fish. Escapement into this system is typically doubled to represent the West Fork contributions.

^b Sonar operated in research mode only.

^c Pilot Station sonar operations in 2009 were affected by extreme low water and poor catchability of fall chum salmon resulting in concerns for over estimation of coho salmon in the drift gillnet apportionment.

^d Data are preliminary.

APPENDIX C: SUBSISTENCE AND PERSONAL USE HARVEST

Appendix C1.—Yukon management area regulatory subsistence and personal use salmon fishing schedule.

Area	Regulatory fishing periods	Open fishing times
Coastal District	7 days per week	M/T/W/TH/F/SA/SU - 24 hours/day
District 1	Two 36-hour periods per week	Monday 8:00 p.m. to Wednesday 8:00 AM / Thursday 8:00 PM. to Saturday 8:00 AM
District 2	Two 36-hour periods per week	Wednesday 8:00 PM. to Friday 8:00 AM / Sunday 8:00 PM. to Tuesday 8:00 AM
District 3	Two 36-hour periods per week	Wednesday 8:00 PM. to Friday 8:00 AM / Sunday 8:00 PM. to Tuesday 8:00 AM
District 4	Two 48-hour periods per week	Sunday 6:00 PM. to Tuesday 6:00 PM / Wednesday 6:00 PM. to Friday 6:00 PM
Koyukuk and Innoko Rivers	7 days per week	M/T/W/TH/F/SA/SU - 24 hours/day
Subdistricts 5-A, -B, -C	Two 48-hour periods per week	Tuesday 6:00 PM. to Thursday 6:00 PM / Friday 6:00 PM. to Sunday 6:00 PM.
Subdistrict 5-D	7 days per week	M/T/W/TH/F/SA/SU - 24 hours/day
Subdistricts 6-A, -B	Two 42-hour periods per week	Monday 6:00 PM. to Wednesday 12:00 noon / Friday 6:00 PM. to Sunday 12:00 noon
Subdistrict 6-C (Personal Use)	Two 42-hour periods per week	Monday 6:00 PM. to Wednesday 12:00 noon / Friday 6:00 PM. to Sunday 12:00 noon
Old Minto Area	5 days per week	Friday 6:00 PM. to Wednesday 6:00 PM

Note: This schedule was altered in season based on Chinook and fall chum salmon run strength.

Appendix C2.—Chinook salmon total utilization in numbers of fish by district, area, and country, Yukon River drainage, 2001–2021.

Year	Coastal	District 1				District 2			
	Subsistence ^a	Subsistence	Commercial ^b	Test fish sales	Total	Subsistence	Commercial ^b	Test fish sales	Total
2001	2,882	7,089	—	0	7,089	13,442	—	0	13,442
2002	1,122	5,603	11,089	494	17,186	8,954	11,440	34	20,428
2003	1,850	6,332	22,709	619	29,660	9,668	14,220	61	23,949
2004	2,038	5,880	28,403	722	35,005	9,724	24,145	70	33,939
2005	848	5,058	16,694	310	22,062	9,156	13,413	0	22,569
2006	883	5,122	23,748	817	29,687	8,039	19,843	0	27,882
2007	1,198	6,059	18,616	792	25,467	10,553	13,306	57	23,916
2008	1,492	6,163	2,530	0	8,693	8,826	2,111	0	10,937
2009	905	4,125	90	0	4,215	6,135	226	0	6,361
2010	1,300	5,856	5,744	0	11,600	8,676	4,153	0	12,829
2011	769	6,255	36 ^c	0	6,291	8,069	46 ^c	0	8,115
2012	2,104	4,313	0 ^c	0	4,313	6,881	0 ^c	0	6,881
2013	1,542	1,634	0 ^c	0	1,634	1,104	0 ^c	0	1,104
2014	563	1,356	0 ^c	0	1,356	616	0 ^c	0	616
2015	966	1,919	0 ^c	0	1,919	1,185	0 ^c	0	1,185
2016	886	2,752	0 ^c	0	2,752	3,161	0 ^c	0	3,161
2017	1,053 ^d	4,580 ^d	168 ^c	0	4,748	5,023 ^d	0 ^c	0	5,023
2018	1,117 ^d	3,269 ^d	0 ^c	0	3,269	4,148 ^d	0 ^c	0	4,148
2019	2,017 ^d	7,040 ^d	2,100	0	9,140	8,258 ^d	1,010	0	9,268
2020	1,371 ^d	3,720 ^d	0	0	3,720	4,726 ^d	0	0	4,726
2021	30 ^d	731 ^d	—	0	731	715 ^d	—	0	715
Averages									
2011–2020	1,239	3,684	230	0	3,914	4,317	106	0	4,423
2016–2020	1,289	4,272	454	0	4,726	5,063	202	0	5,265

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Year	District 3			Lower Yukon management area subtotals ^a			
	Subsistence	Commercial ^b	Total	Subsistence	Commercial	Test fish sales	Total
2001	6,361	–	6,361	29,774	–	0	29,774
2002	4,139	–	4,139	19,818	22,529	528	42,875
2003	5,002	–	5,002	22,852	36,929	680	60,461
2004	4,748	–	4,748	22,390	52,548	792	75,730
2005	5,131	–	5,131	20,193	30,107	310	50,610
2006	5,374	315	5,689	19,418	43,906	817	64,141
2007	4,651	190	4,841	22,461	32,112	849	55,422
2008	5,855	–	5,855	22,336	4,641	0	26,977
2009	2,924	–	2,924	14,089	316	0	14,405
2010	4,299	–	4,299	20,131	9,897	0	30,028
2011	4,134	–	4,134	19,227	82	0	19,309
2012	2,362	–	2,362	15,660	0	0	15,660
2013	444	–	444	4,724	0	0	4,724
2014	48	–	48	2,583	0	0	2,583
2015	447	–	447	4,517	0	0	4,517
2016	901	–	901	7,700	0	0	7,700
2017	2,296 ^d	–	2,296	12,952 ^d	168	0	13,120
2018	1,803 ^d	–	1,803	10,337 ^d	0	0	10,337
2019	3,306 ^d	–	3,306	20,621 ^d	3,110	0	23,731
2020	714 ^d	–	714	10,531 ^d	0	0	10,531
2021	33 ^d	–	33	1,509 ^d	0	0	1,509
Averages							
2011–2020	1,646	NA	1,646	10,885	336	0	11,221
2016–2020	1,804	NA	1,804	12,428	656	0	13,084

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Year	District 4				District 5			
	Subsistence	Commercial	Commercial related ^e	Total	Subsistence	Commercial	Commercial related ^e	Total
2001	10,152	—	—	10,152	13,566	—	—	13,566
2002	9,456	—	—	9,456	13,401	771	0	14,172
2003	12,771	562	0	13,333	19,191	1,134	0	20,325
2004	16,269	—	—	16,269	15,666	1,546	0	17,212
2005	13,964	—	—	13,964	17,424	1,469	0	18,893
2006	12,022	—	—	12,022	15,924	1,839	0	17,763
2007	11,831	0	0	11,831	19,165	1,241	0	20,406
2008	10,619	0	0	10,619	11,626	—	—	11,626
2009	9,514	0	0	9,514	8,917	—	—	8,917
2010	12,888	0	0	12,888	10,397	—	—	10,397
2011	9,893	—	—	9,893	10,493	—	—	10,493
2012	7,662	0	0	7,662	6,466	—	—	6,466
2013	2,901	0	0	2,901	4,541	—	—	4,541
2014	132	0	0	132	288	—	—	288
2015	771	—	—	771	1,849	—	—	1,849
2016	6,015	—	—	6,015	7,081	—	—	7,081
2017	9,783 ^d	—	—	9,783	14,523 ^d	—	—	14,523
2018	6,783 ^d	—	—	6,783	14,077 ^d	—	—	14,077
2019	11,746 ^d	—	—	11,746	15,415 ^d	0	0	15,415
2020	4,578 ^d	—	—	4,578	5,997 ^d	0	0	5,997
2021	4 ^d	—	—	4	475 ^d	—	0	475
Averages								
2011–2020	6,026	0	0	6,026	8,073	0	0	8,073
2016–2020	7,781	NA	NA	7,781	11,419	0	0	11,419

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Year	District 6					Upper Yukon management area subtotals				
	Subsistence	Commercial	Commercial related ^e	Personal use	Total	Subsistence	Commercial	Commercial related ^e	Personal use	Total ^f
2001	2,327	—	—	122	2,449	26,045	0	0	122	26,167
2002	1,067	836	230	126	2,259	23,924	1,607	230	126	25,887
2003	2,145	1,813	0	204	4,162	34,107	3,509	0	204	37,820
2004	1,388	2,057	0	201	3,646	33,323	3,603	0	201	37,127
2005	1,828	453	0	138	2,419	33,216	1,922	0	138	35,276
2006	1,229	84	0	89	1,402	29,175	1,923	0	89	31,187
2007	1,717	281	0	136	2,134	32,713	1,522	0	136	34,371
2008	605	0	0	126	731	22,850	0	0	126	22,976
2009	1,285	0	0	127	1,412	19,716	0	0	127	19,843
2010	1,143	0	0	162	1,305	24,428	0	0	162	24,590
2011	1,367	0	0	89	1,456	21,753	0	0	89	21,842
2012	627	0	0	71	698	14,755	0	0	71	14,826
2013	367	0	0	42	409	7,809	0	0	42	7,851
2014	283	0	0	1	284	703	0	0	1	704
2015	440	0	0	5	445	3,060	0	0	5	3,065
2016	816	0	0	57	873	13,912	0	0	57	13,969
2017	778 ^d	0	0	125	903	25,084 ^d	0	0	125	25,209
2018	615 ^d	0	0	201	816	21,475 ^d	0	0	201	21,676
2019	597 ^d	0	0	244	841	27,758 ^d	0	0	244	28,002
2020	425 ^d	0	0	112	537	11,000 ^d	0	0	112	11,112
2021	7 ^d	—	—	0	7	486 ^d	0	0	0	486
Averages										
2011–2020	632	0	0	95	726	14,731	0	0	95	14,826
2016–2020	646	0	0	148	794	19,846	0	0	148	19,994

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Year	Alaska Yukon management area totals						Total
	Subsistence ^a	Commercial	Commercial related ^c	Personal use	Test fish sales	Sport fish	
2001	55,819	0	0	122	0	679	56,620
2002	43,742	24,136	230	126	528	486	69,248
2003	56,959	40,438	0	204	680	2,719	101,000
2004	55,713	56,151	0	201	792	1,513	114,370
2005	53,409	32,029	0	138	310	483	86,369
2006	48,593	45,829	0	89	817	739	96,067
2007	55,174	33,634	0	136	849	960	90,753
2008	45,186	4,641	0	126	0	409	50,362
2009	33,805	316	0	127	0	863	35,111
2010	44,559	9,897	0	162	0	474	55,092
2011	40,980	82	0	89	0	474	41,625
2012	30,415	0	0	71	0	345	30,831
2013	12,533	0	0	42	0	166	12,741
2014	3,286	0	0	1	0	0	3,287
2015	7,577	0	0	5	0	13	7,595
2016	21,612	0	0	57	0	20	21,689
2017	38,036 ^d	168	0	125	0	18	38,347
2018	31,812 ^d	0	0	201	0	200	32,213
2019	48,379 ^d	3,110	0	244	0	38	51,771
2020	21,531 ^d	0	0	112	0	49	21,692
2021	1,995 ^d	0	0	0	0	0 ^d	1,995
Averages							
2011–2020	25,616	336	0	95	0	132	26,179
2016–2020	32,274	656	0	148	0	65	33,142

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Canada: Yukon Territories totals								
Mainstem Yukon							Porcupine Aboriginal	Total Canada
Year	Non-commercial			Test fish ^g	Commercial	Subtotal		
	Domestic	Aboriginal	Public angling					
2001	89	7,421	146	767	1,351	9,774	370	10,144
2002	59	7,139	128	1,036	708	9,070	188	9,258
2003	115	6,121	275	263	2,672	9,446	173	9,619
2004	88	6,483	423	167	3,785	10,946	292	11,238
2005	99	6,376	436	—	4,066	10,977	394	11,371
2006	63	5,757	606	—	2,332	8,758	314	9,072
2007	—	4,175	2	617	—	4,794	300	5,094
2008	—	2,885	0	513	1	3,399	314	3,713
2009	17	3,791	125	—	364	4,297	461	4,758
2010	—	2,455	1	—	—	2,456	250	2,706
2011	—	4,550	40	—	4	4,594	290	4,884
2012	—	2,000	—	—	0	2,000	200	2,200
2013	—	1,902	—	—	2	1,904	242	2,146
2014	—	100	—	—	—	100	3	103
2015	—	1,000	—	—	—	1,000	204	1,204
2016	—	2,768	—	—	1	2,769	177	2,946
2017	—	3,500	—	—	0	3,500	131	3,631
2018	—	2,789 ^d	—	—	1	2,790	308	3,098
2019	—	2,764	—	—	0	2,764	340	3,104
2020	—	2,363	—	—	0	2,363	180	2,543
2021	—	306	—	—	0	306	16	322
Averages								
2011–2020	NA	2,374	NA	NA	1	2,378	208	2,586
2016–2020	NA	2,837	NA	NA	0	2,837	227	3,064

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Year	Yukon River Drainage (Alaska/Canada) totals						Total
	Subsistence ^{a, h}	Commercial	Commercial related ^e	Personal use	Alaska test fish	Sport fish	
2001	64,466	1,351	0	122	0	825	66,764
2002	52,164	24,844	230	126	528	614	78,506
2003	63,631	43,110	0	204	680	2,994	110,619
2004	62,743	59,936	0	201	792	1,936	125,608
2005	60,278	36,095	0	138	310	919	97,740
2006	54,727	48,161	0	89	817	1,345	105,139
2007	60,266	33,634	0	136	849	962	95,847
2008	48,898	4,642	0	126	0	409	54,075
2009	38,074	680	0	127	0	988	39,869
2010	47,264	9,897	0	162	0	475	57,798
2011	45,820	86	0	89	0	514	46,509
2012	32,615	0	0	71	0	345	33,031
2013	14,677	2	0	42	0	166	14,887
2014	3,389	0	0	1	0	0	3,390
2015	8,781	0	0	5	0	13	8,799
2016	24,635	1	0	57	0	20	24,650
2017	41,667 ^d	168	0	125	0	18	41,978
2018	34,909 ^d	1	0	201	0	200	35,311
2019	51,483 ^d	3,110	0	244	0	38	54,875
2020	24,074 ^d	0	0	112	0	49	24,235
2021	2,317 ^d	0	0	0	0	— ⁱ	2,317
Averages							
2011–2020	28,205	337	0	95	0	146	28,767
2016–2020	35,354	656	0	148	0	69	36,210

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Note: En dashes (–) = no data. NA indicates insufficient data to calculate averages.

- ^a Includes harvest from the Coastal District communities of Hooper Bay and Scammon Bay.
- ^b All fish sold in the round. Estimates for illegal sales (from the 1990s) are included in District 1 and 2 harvests.
- ^c Commercial sales were prohibited during the summer season from 2011 to 2018. Chinook salmon were sold during the fall season in 2011 and 2017.
- ^d Data are preliminary.
- ^e Commercial related refers to the estimated harvest of female Chinook salmon to produce roe sold.
- ^f No test fish sales occurred in the upper Yukon management area.
- ^g Canada Chinook salmon test fishery is conducted for management purposes. The fish harvested are retained and given to Aboriginal or Domestic users, but are not reported under those categories.
- ^h Includes Alaska subsistence harvest and Canada Domestic, test fish, and Aboriginal harvests.
- ⁱ Data are unavailable.

Appendix C3.—Summer chum salmon total utilization in numbers of fish by district and area, Yukon River drainage, 2001–2021.

Year	Coastal	District 1				District 2			
	Subsistence ^a	Subsistence	Commercial ^b	Test fish sales	Total	Subsistence	Commercial ^b	Test fish sales	Total
2001	13,916	22,771	—	0	22,771	26,303	—	0	26,303
2002	14,796	24,107	6,327	164	30,598	23,554	4,027	54	27,635
2003	13,968	19,701	3,579	37	23,317	16,773	2,583	82	19,438
2004	8,262	20,620	13,993	217	34,830	25,931	5,782	0	31,713
2005	14,357	27,695	23,965	134	51,794	24,277	8,313	0	32,590
2006	24,171	27,881	21,816	456	50,153	31,655	25,543	0	57,198
2007	16,121	24,209	106,790	10	131,009	23,507	69,432	0	92,939
2008	18,120	22,767	67,459	80	90,306	24,291	58,139	0	82,430
2009	12,797	23,998	71,335	0	95,333	21,089	86,571	0	107,660
2010	22,425	25,172	102,267	0	127,439	23,738	80,948	0	104,686
2011	18,305	28,590	163,439	0	192,029	24,692	103,071	0	127,763
2012	23,241	35,370	150,800	1,274	187,444	32,566	57,049	1,138	90,753
2013	23,135	28,516	207,871	2,304	238,691	32,499	171,272	0	203,771
2014	19,304	23,894	198,240	0	222,134	26,134	229,107	0	255,241
2015	20,468	21,641	172,639	2,494	196,774	24,557	181,447	0	206,004
2016	11,844	26,558	293,522	380	320,460	27,622	228,267	0	255,889
2017	14,005 ^c	22,507 ^c	345,395	1,819	369,721	24,694 ^c	47,770	0	72,464
2018	15,351 ^c	21,282 ^c	250,958	1,028	273,268	19,035 ^c	195,423	0	214,458
2019	7,036 ^c	22,779 ^c	183,658	230	206,667	22,368 ^c	41,835	0	64,203
2020	7,226 ^c	15,289 ^c	9,600	0	24,889	13,645 ^c	4,355	0	18,000
2021	303 ^c	354 ^c	—	0	354	489 ^c	—	0	489
Averages									
2011–2020	15,992	24,643	197,612	953	223,208	24,781	125,960	114	150,855
2016–2020	11,092	21,683	216,627	691	239,001	21,473	103,530	0	125,003

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Year	District 3			Lower Yukon management area subtotals ^a			
	Subsistence	Commercial	Total	Subsistence	Commercial	Test fish sales	Total
2001	1,309	–	1,309	64,299	–	0	64,299
2002	2,506	–	2,506	64,963	10,354	218	75,535
2003	5,858	–	5,858	56,300	6,162	119	62,581
2004	2,958	–	2,958	57,771	19,775	217	77,763
2005	5,766	–	5,766	72,095	32,278	134	104,507
2006	3,534	116	3,650	87,241	47,475	456	135,172
2007	2,056	1	2,057	65,893	176,223	10	242,126
2008	2,971	–	2,971	68,149	125,598	80	193,827
2009	1,146	–	1,146	59,030	157,906	0	216,936
2010	1,341	–	1,341	72,676	183,215	0	255,891
2011	2,733	–	2,733	74,320	266,510	0	340,830
2012	8,690	–	8,690	99,867	207,849	2,412	310,128
2013	4,692	–	4,692	88,842	379,143	2,304	470,289
2014	3,748	–	3,748	73,080	427,347	0	500,427
2015	3,127	–	3,127	69,793	354,086	2,494	426,373
2016	3,064	–	3,064	57,244	521,789	380	579,413
2017	3,760 ^c	–	3,760	64,966 ^c	393,165	1,819	459,950
2018	3,054 ^c	–	3,054	58,722 ^c	446,381	1,028	506,131
2019	2,355 ^c	–	2,355	54,538 ^c	225,493	230	280,261
2020	861 ^c	–	861	37,021 ^c	13,955	0	50,976
2021	81 ^c	–	81	1,227 ^c	0	0	1,227
Averages							
2011–2020	3,608	NA	3,608	67,839	323,572	1,067	392,478
2016–2020	2,619	NA	2,619	54,498	320,157	691	375,346

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Year	District 4					District 5			
	Subsistence	Commercial	Commercial related ^d	Anvik River ^e	Total	Subsistence	Commercial	Commercial related ^d	Total
2001	4,588	–	–	–	4,588	2,856	–	–	2,856
2002	15,971	–	–	–	15,971	5,610	6	0	5,616
2003	17,513	62	0	–	17,575	5,545	0	0	5,545
2004	14,959	–	–	–	14,959	3,411	25	0	3,436
2005	12,350	–	–	–	12,350	6,800	0	0	6,800
2006	14,997	–	–	–	–	11,830	20	0	11,850
2007	16,256	7,304 ^f	0	–	23,560	8,881	0	0	8,881
2008	13,517	23,746 ^f	0	–	37,263	3,537	–	–	3,537
2009	14,958	4,589 ^f	0	–	19,547	5,298	–	–	5,298
2010	11,720	44,207 ^g	0	–	55,927	3,555	–	–	3,555
2011	13,166	–	–	–	13,166	7,709	–	–	7,709
2012	21,555	108,222	0	–	129,777	4,892	–	–	4,892
2013	13,761	100,507	0	–	114,268	11,417	–	–	11,417
2014	9,981	96,385	0	–	106,366	3,108	–	–	3,108
2015	9,777	–	–	–	9,777	3,745	–	–	3,745
2016	13,728	–	–	–	13,728	4,990	–	–	4,990
2017	16,527 ^c	159,051	–	–	175,578	5,033 ^c	–	–	5,033
2018	11,494 ^c	126,892	–	–	138,386	6,445 ^c	–	–	6,445
2019	7,534 ^c	–	–	–	7,534	803 ^c	–	–	803
2020	4,097 ^c	–	–	–	4,097	422 ^c	–	–	422
2021	2 ^c	–	–	–	2	33 ^c	–	–	33
Averages									
2011–2020	12,162	118,211	0	NA	71,268	4,856	NA	NA	4,856
2016–2020	10,676	142,972	NA	NA	67,865	3,539	NA	NA	3,539

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Year	District 6						Upper Yukon management area subtotals					
	Subsistence	Commercial	Commercial related ^d	Personal use	Test fish sales	Total	Subsistence	Commercial	Commercial related ^d	Personal use	Test fish sales	Total
2001	412	–	–	146	0	558	7,856	–	–	146	0	8,002
2002	512	3,198	19	175	0	3,904	22,093	3,204	19	175	0	25,491
2003	2,914	4,461	0	148	0	7,523	25,972	4,523	0	148	0	30,643
2004	1,793	6,610	0	231	0	8,634	20,163	6,635	0	231	0	27,029
2005	2,014	8,986	0	152	0	11,152	21,164	8,986	0	152	0	30,302
2006	1,010	44,621	0	262	0	45,893	27,837	44,641	0	262	0	57,743
2007	1,896	14,674	0	184	0	16,754	27,033	21,978	0	184	0	49,195
2008	1,311	1,842	0	138	0	3,291	18,365	25,588	0	138	0	44,091
2009	1,253	7,777	0	308	0	9,338	21,509	12,366	0	308	0	34,183
2010	422	5,466	0	319	0	6,207	15,697	49,673	0	319	0	65,689
2011	825	8,651	0	439	0	9,915	21,700	8,651	0	439	0	30,790
2012	678	3,504	0	321	0	4,503	27,125	111,726	0	321	0	139,172
2013	1,094	5,937	0	138	0	7,169	26,272	106,444	0	138	0	132,854
2014	731	6,912	0	235	0	7,878	13,820	103,297	0	235	0	117,352
2015	252	4,770	0	220	0	5,242	13,774	4,770	0	220	0	18,764
2016	272	4,020	0	176	0	4,468	18,990	4,020	0	176	0	23,186
2017	911 ^c	4,300	0	438 ^c	0	5,649	22,471 ^c	163,351	0	438 ^c	0	186,260
2018	265 ^c	3,427	0	509 ^c	0	4,201	18,204 ^c	130,319	0	509 ^c	0	149,032
2019	428 ^c	1,596	0	294 ^c	0	2,318	8,765 ^c	1,596	0	294 ^c	0	10,655
2020	115 ^c	0	0	67 ^c	0	182	4,634 ^c	0	0	67 ^c	0	4,701
2021	4 ^c	–	–	0 ^c	0	4	39 ^c	–	0	0 ^c	0	39
Averages												
2011–2020	557	4,312	0	284	0	5,153	17,576	63,417	0	284	0	81,277
2016–2020	398	2,669	0	297	0	3,364	14,613	59,857	0	297	0	74,767

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Year	Alaska Yukon management area totals						Total
	Subsistence ^a	Commercial	Commercial related ^d	Personal use	Test fish sales	Sport fish ^h	
2001	72,155	—	0	146	0	82	72,383
2002	87,056	13,558	19	175	218	384	101,410
2003	82,272	10,685	0	148	119	1,638	94,862
2004	77,934	26,410	0	231	217	203	104,995
2005	93,259	41,264	0	152	134	435	135,244
2006	115,078	92,116	0	262	456	583	208,495
2007	92,926	198,201	0	184	10	245	291,566
2008	86,514	151,186	0	138	80	371	238,289
2009	80,539	170,272	0	308	0	174	251,293
2010	88,373	232,888	0	319	0	1,183	322,763
2011	96,020	275,161	0	439	0	294	371,914
2012	126,992	319,575	0	321	2,412	271	449,571
2013	115,114	485,587	0	138	2,304	1,423	604,566
2014	86,900	530,644	0	235	0	374	618,153
2015	83,567	358,856	0	220	2,494	194	445,331
2016	88,078	525,809	0	176	380	264	614,707
2017	87,437 ^c	556,516	0	438 ^c	1,819	186	646,396
2018	76,926 ^c	576,700	0	509 ^c	1,028	200	655,363
2019	63,303 ^c	227,089	0	294 ^c	230	36	290,952
2020	41,655 ^c	13,955	0	67 ^c	0	1,648	57,325
2021	1,266 ^c	0	0	0 ^c	0	— ⁱ	1,266
Averages							
2011–2020	86,599	386,989	0	284	1,067	489	475,428
2016–2020	71,480	380,014	0	297	691	467	452,949

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Note: En dashes (–) = no data. NA indicates insufficient data to calculate averages.

- ^a Includes harvest from the Coastal District communities of Hooper Bay and Scammon Bay.
- ^b All fish sold in the round.
- ^c Data are preliminary.
- ^d Commercial related refers to the estimated number of females and incidental males harvested to produce roe sold, excluding the Anvik River. Beginning in 2006, the numbers of females harvested are included in the total commercial harvest.
- ^e Only roe has been sold in the Anvik River commercial fishery. The commercial related harvest shown is the estimated number of females harvested to produce roe sold.
- ^f The number of female fish from which roe were extracted is the number harvested. Males not purchased and recorded as caught but not sold are included in personal use tables.
- ^g Both males and females were purchased and are included in the number harvested.
- ^h Estimated sport fish harvest for all chum salmon (assumes majority of chum salmon caught during summer season) in Alaska portion of the drainage.
- ⁱ Data are unavailable.

Appendix C4.—Fall chum salmon total utilization in numbers of fish by district, area, and country, Yukon River drainage, 2001–2021.

Year	Coastal	District 1				District 2			
	Subsistence ^a	Subsistence	Commercial	Test fish sales ^b	Total	Subsistence	Commercial	Test fish sales ^b	Total
2001	559	3,437	—	—	3,437	3,256	—	—	3,256
2002	284	1,881	—	—	1,881	1,618	—	—	1,618
2003	146	2,139	5,586	0	7,725	2,901	—	—	2,901
2004	320	2,067	660	0	2,727	2,421	—	—	2,421
2005	70	2,889	130,525	87	133,501	3,257	—	—	3,257
2006	187	3,902	101,254	0	105,156	4,015	39,905	0	43,920
2007	234	4,390	38,852	0	43,242	3,472	35,826	0	39,298
2008	386	2,823	67,704	0	70,527	3,522	41,270	0	44,792
2009	158	1,917	11,911	0	13,828	1,563	12,072	0	13,635
2010	186	3,202	545	0	3,747	1,419	270	0	1,689
2011	315	3,434	127,735	0	131,169	2,578	100,731	0	103,309
2012	11	7,622	139,842	74	147,538	3,332	129,284	92	132,708
2013	149	3,673	106,588	121	110,382	4,878	106,274	0	111,152
2014	252	4,072	51,829	30	55,931	5,817	59,138	0	64,955
2015	198	5,877	100,562	50	106,489	6,258	74,214	0	80,472
2016	762	4,572	226,576	668	231,816	4,539	213,340	0	217,879
2017	561 ^c	4,587 ^c	328,410	1,246	334,243	4,175 ^c	134,668	0	138,843
2018	525 ^c	3,680 ^c	198,950	907	203,537	3,004 ^c	170,648	0	173,652
2019	815 ^c	4,251 ^c	145,692	275	150,218	3,809 ^c	106,141	0	109,950
2020	671 ^c	1,594 ^c	—	—	1,938	937 ^c	—	—	937
2021	39 ^c	143 ^c	—	—	143	435 ^c	—	—	435
Averages									
2011–2020	426	4,336	158,465	375	147,326	3,933	121,604	10	113,386
2016–2020	667	3,737	224,907	774	184,350	3,293	156,199	0	128,252

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Year	District 3 ^d	Lower Yukon management area subtotals ^a			
	Subsistence	Subsistence	Commercial	Test fish sales ^b	Total
2001	700	7,952	–	–	7,952
2002	164	3,947	–	–	3,947
2003	738	5,924	5,586	0	11,510
2004	298	5,106	660	0	5,766
2005	1,304	7,520	130,525	87	138,132
2006	480	8,584	141,159	0	149,743
2007	925	9,021	74,678	0	83,699
2008	1,821	8,552	108,974	0	117,526
2009	937	4,575	23,983	0	28,558
2010	1,325	6,132	815	0	6,947
2011	354	6,681	228,466	0	235,147
2012	637	11,602	269,126	166	280,894
2013	1,764	10,464	212,862	121	223,447
2014	2,457	12,598	110,967	30	123,595
2015	1,388	13,721	174,776	50	188,547
2016	997	10,108	439,916	668	450,692
2017	1,304 ^c	10,627 ^c	463,078	1,246	474,951
2018	706 ^c	7,915 ^c	369,598	907	378,420
2019	754 ^c	9,629 ^c	251,833	275	261,737
2020	26 ^c	3,228 ^c	–	–	4,203
2021	0 ^c	617 ^c	–	–	617
Averages					
2011–2020	1,039	9,657	280,069	385	262,066
2016–2020	757	8,301	381,106	774	313,806

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Year	District 4			District 5		
	Subsistence	Commercial ^e	Total	Subsistence	Commercial ^e	Total
2001	3,352	–	3,352	20,873	–	20,873
2002	1,549	–	1,549	10,976	–	10,976
2003	9,750	1,315	11,065	28,270	–	28,270
2004	7,797	–	7,797	40,670	0	40,670
2005	9,405	–	9,405	51,663	0	51,663
2006	6,335	–	6,335	52,158	10,030	62,188
2007	8,576	–	8,576	53,731	427	54,158
2008	7,412	0	7,412	57,258	4,556	61,814
2009	7,382	–	7,382	38,083	–	38,083
2010	6,788	–	6,788	44,334	–	44,334
2011	7,260	–	7,260	51,885	1,246	53,131
2012	18,055	811	18,866	54,350	2,419	56,769
2013	15,191	–	15,191	76,098	1,041	77,139
2014	15,936	–	15,936	51,197	1,264	52,461
2015	13,274	–	13,274	50,260	1,048	51,308
2016	10,034	–	10,034	58,831	7,542	66,373
2017	9,609 ^e	1,402	11,011	60,438 ^e	1,952 ^f	62,390
2018	5,779 ^e	596	6,375	44,891 ^e	896	45,787
2019	4,232 ^e	–	4,232	45,071 ^e	900	45,971
2020	369 ^e	–	369	1,897 ^e	–	1,897
2021	0 ^e	–	0	71 ^e	–	71
Averages						
2011–2020	9,974	936	10,255	49,492	2,034	51,323
2016–2020	6,005	999	6,404	42,226	2,823	44,484

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Year	District 6				Upper Yukon management area subtotals			
	Subsistence ^e	Commercial ^e	Personal use	Total	Subsistence ^g	Commercial ^e	Personal use	Total
2001	3,526	–	10	3,536	27,751	–	10	27,761
2002	3,202	–	3	3,205	15,727	–	3	15,730
2003	12,986	4,095	394	17,475	51,006	5,410	394	56,810
2004	8,953	3,450	230	12,633	57,420	3,450	230	61,100
2005	22,946	49,637	133	72,716	84,014	49,637	133	133,784
2006	16,925	23,353	333	40,611	75,418	33,383	333	109,134
2007	29,893	15,572	173	45,638	92,200	15,999	173	108,372
2008	16,135	5,735	181	22,051	80,805	10,291	181	91,277
2009	16,079	1,286	78	17,443	61,544	1,286	78	62,908
2010	11,391	1,735	3,209	16,335	62,513	1,735	3,209	67,457
2011	14,376	9,267	347	23,990	73,521	10,513	347	84,381
2012	15,302	17,336	410	33,048	87,707	20,566	410	108,683
2013	11,640	24,148	383	36,171	102,929	25,189	383	128,501
2014	12,798	3,368	278	16,444	79,931	4,632	278	84,841
2015	9,345	15,646	80	25,071	72,879	16,694	80	89,653
2016	4,882	18,053	283	23,218	74,030	25,595	283	99,908
2017	4,419 ^e	23,270 ^g	626 ^e	28,315	74,466 ^e	26,624 ^f	626 ^e	101,716
2018	5,909 ^e	16,698	514 ^e	23,121	56,579 ^e	18,190	514	75,283
2019	4,930 ^e	15,627	408 ^e	20,965	54,233 ^e	16,527	408	71,168
2020	202 ^e	–	37 ^e	238	2,468 ^e	–	37	2,505
2021	17 ^e	–	0 ^e	17	88 ^e	–	0	88
Averages								
2011–2020	8,380	15,935	337	23,058	67,828	18,281	337	84,618
2016–2020	4,068	18,412	374	19,171	52,262	21,734	374	70,023

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Year	Alaska Yukon management area totals						Canada: Yukon management area totals					
	Subsistence ^a	Commercial	Commercial related ^d	Personal use	Test fish sales ^b	Total	Mainstem Yukon River				Porcupine Aboriginal	Total
							Domestic	Aboriginal	Commercial	Subtotal		
2001	35,703	–	–	10	–	35,713	3	3,077	2,198	5,278	4,594	9,872
2002	19,674	–	–	3	–	19,677	0	3,167	3,065	6,232	1,860	8,092
2003	56,930	10,996	0	394	0	68,320	0	1,493	9,030	10,523	382	10,905
2004	62,526	4,110	0	230	0	66,866	0	2,180	7,365	9,545	205	9,750
2005	91,534	180,162	0	133	87	271,916	13	2,035	11,931	13,979	4,593	18,572
2006	84,002	174,542	0	333	0	258,877	0	2,521	4,096	6,617	5,179	11,796
2007	101,221	90,677	0	173	0	192,071	0	2,221	7,109	9,330	4,500	13,830
2008	89,357	119,265	0	181	0	208,803	0	2,068	4,062	6,130	3,436	9,566
2009	66,119	25,269	0	78	0	91,466	0	820	293	1,113	898	2,011
2010	68,645	2,550	0	3,209	0	74,404	0	1,523	2,186	3,709	2,078	5,787
2011	80,202	238,979	0	347	0	319,528	0	1,000	5,312	6,312	1,851	8,163
2012	99,309	289,692	0	410	166	389,577	0	700	3,205	3,905	3,118	7,023
2013	113,393	238,051	0	383	121	351,948	18	500	3,369	3,887	2,283	6,170
2014	92,529	115,599	0	278	30	208,436	19	546	2,485	3,050	1,983	5,033
2015	86,600	191,470	0	80	50	278,200	35	1,000	2,862	3,897	556	4,453
2016	84,900	465,511	0	283	668	551,362	0	1,000	1,745	2,745	3,005	5,750
2017	85,093 ^c	489,702	0	626 ^c	1,246	576,667	0	1,000	2,404	3,404	2,312	5,716
2018	64,494 ^c	387,788	0	514 ^c	907	453,703	0	1,000	1,957	2,957	1,874	4,831
2019	63,862 ^c	268,360	0	408 ^c	275	332,905	31	1,000	1,728	2,759	1,000	3,759
2020	6,207 ^c	–	–	37 ^c	–	6,244	–	0	–	0	100	100
2021	0 ^c	–	–	0 ^c	–	0	–	0	–	0	21	21
Averages												
2011–2020	77,659	298,350	0	337	385	346,857	11	775	2,785	3,292	1,808	5,100
2016–2020	60,911	402,840	0	374	774	384,176	8	800	1,959	2,373	1,658	4,031

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Year	Yukon River drainage (Alaska/Canada) totals					
	Subsistence ^{a, h}	Commercial	Commercial related ^d	Personal use	Alaska test fish ^b	Total
2001	43,377	2,198	0	10	–	45,585
2002	24,701	3,065	0	3	–	27,769
2003	58,805	20,026	0	394	0	79,225
2004	64,911	11,475	0	230	0	76,616
2005	98,175	192,093	0	133	87	290,488
2006	91,702	178,638	0	333	0	270,673
2007	107,942	97,786	0	173	0	205,901
2008	94,861	123,327	0	181	0	218,369
2009	67,837	25,562	0	78	0	93,477
2010	72,246	4,736	0	3,209	0	80,191
2011	83,053	244,291	0	347	0	327,691
2012	103,127	292,897	0	410	166	396,600
2013	116,194	241,420	0	383	121	358,118
2014	95,077	118,084	0	278	30	213,469
2015	88,191	194,332	0	80	50	282,653
2016	88,905	467,256	0	283	668	557,112
2017	88,405 ^c	492,106	0	626 ^c	1,246	582,383
2018	67,368 ^c	389,745	0	514 ^c	907	458,534
2019	65,893 ^c	270,088	0	408 ^c	275	336,664
2020	6,307 ^c	–	–	37 ^c	–	6,344
2021	726 ^c	–	–	0 ^c	–	21
Averages						
2011–2020	80,252	301,135	0	337	385	351,957
2016–2020	63,376	404,799	0	374	774	388,207

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Note: En dashes (–) = no data. NA indicates insufficient data to calculate averages.

- ^a Includes harvest from the Coastal District communities of Hooper Bay and Scammon Bay.
- ^b The number of salmon sold by ADF&G test fisheries in the lower Yukon.
- ^c Data are preliminary.
- ^d No commercial sales in District 3 from 1991 to 2019.
- ^e Harvest reports in numbers of fish sold in the round. Includes estimated number of females to produce roe sold in years with roe sales.
- ^f The number of females harvested (138 fish) to produce the roe sold is included in the subsistence harvest estimate.
- ^g Includes 290 headed and gutted fish sold and used to produce roe sold.
- ^h Includes Alaska subsistence harvest and Canada Domestic and Aboriginal harvests.

Appendix C5.—Coho salmon total utilization in numbers of fish by district, area, and country, Yukon River drainage, 2001–2021.

Year	Coastal	District 1				District 2			
	Subsistence ^a	Subsistence	Commercial	Test fish sales ^b	Total	Subsistence	Commercial	Test fish sales ^b	Total
2001	548	1,274	—	—	1,274	1,440	—	—	1,440
2002	248	1,295	—	—	1,295	1,233	—	—	1,233
2003	292	1,260	9,757	0	11,017	1,586	—	—	1,586
2004	63	1,175	1,583	0	2,758	1,500	—	—	1,500
2005	279	976	36,533	0	37,509	1,110	—	—	1,110
2006	335	1,177	39,323	0	40,500	2,459	14,482	0	16,941
2007	110	2,265	21,720	0	23,985	2,347	21,487	0	23,834
2008	116	1,211	13,946	0	15,157	1,997	19,246	0	21,243
2009	246	847	5,994	0	6,841	1,057	1,582	0	2,639
2010	124	1,122	1,027	0	2,149	557	1,023	0	1,580
2011	55	1,127	45,335	0	46,462	823	24,184	0	25,007
2012	93	3,350	39,757	39	43,146	1,346	29,063	0	30,409
2013	287	1,224	27,306	1	28,531	1,080	31,458	0	32,538
2014	204	1,782	54,804	0	56,586	1,769	48,602	0	50,371
2015	174	2,100	66,029	8	68,137	3,002	54,860	0	57,862
2016	355	1,231	113,669	11	114,911	1,131	67,208	0	68,341
2017	435 ^c	1,046 ^c	95,982	63	97,091	1,263 ^c	33,277	0	34,540
2018	871 ^c	966 ^c	65,431	48	66,445	595 ^c	40,845	0	41,440
2019	804 ^c	1,962 ^c	40,621	40	42,623	643 ^c	15,622	0	16,265
2020	350 ^c	552 ^c	—	—	552	494 ^c	—	—	494
2021	50 ^c	36 ^c	—	—	36	126 ^c	—	—	126
Averages									
2011–2020	363	1,534	60,993	23	56,448	1,215	38,347	0	35,727
2016–2020	563	1,151	78,926	41	64,324	825	39,238	0	32,216

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Year	District 3 ^d	Lower Yukon management area subtotals ^a			
	Subsistence	Subsistence ^a	Commercial	Test fish sales ^b	Total
2001	0	3,262	—	—	3,262
2002	115	2,891	—	—	2,891
2003	711	3,849	9,757	0	13,606
2004	284	3,022	1,583	0	4,605
2005	217	2,582	36,533	0	39,115
2006	83	4,054	53,805	0	57,859
2007	739	5,461	43,207	0	48,668
2008	410	3,734	33,192	0	36,926
2009	321	2,471	7,576	0	10,047
2010	353	2,156	2,050	0	4,206
2011	36	2,041	69,519	0	71,560
2012	556	5,345	68,820	39	74,204
2013	371	2,962	58,764	1	61,727
2014	340	4,095	103,406	0	107,501
2015	428	5,704	120,889	8	126,601
2016	140	2,857	180,877	11	183,390
2017	497 ^c	3,241 ^c	129,259	63	132,563
2018	154 ^c	2,586 ^c	106,276	48	108,910
2019	232 ^c	3,641 ^c	56,243	40	59,924
2020	20 ^c	1,416 ^c	—	—	1,977
2021	0 ^c	212 ^c	—	—	0
Averages					
2011–2020	277	3,389	99,339	23	92,815
2016–2020	209	2,748	118,164	41	97,312

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Year	District 4			District 5		
	Subsistence	Commercial ^c	Total	Subsistence	Commercial ^c	Total
2001	2,266	—	2,266	7,674	—	7,674
2002	1,023	—	1,023	2,076	—	2,076
2003	5,773	367	6,140	3,887	—	3,887
2004	4,766	—	4,766	1,423	—	1,423
2005	2,971	—	2,971	2,159	—	2,159
2006	1,302	—	1,302	3,779	—	3,779
2007	2,952	—	2,952	3,366	—	3,366
2008	1,490	0	1,490	3,203	91	3,294
2009	3,986	—	3,986	2,498	—	2,498
2010	1,730	—	1,730	3,604	—	3,604
2011	2,072	—	2,072	1,389	—	1,389
2012	3,556	0	3,556	3,092	634	3,726
2013	4,940	—	4,940	1,298	0	1,298
2014	3,062	—	3,062	2,030	0	2,030
2015	1,941	—	1,941	2,462	0	2,462
2016	826	—	826	861	54	915
2017	529 ^c	0	529	1,007 ^c	0	1,007
2018	1,545 ^c	0	1,545	1,343 ^c	0	1,343
2019	497 ^c	—	497	612 ^c	0	612
2020	136 ^c	—	136	196 ^c	—	196
2021	0 ^c	—	0	31 ^c	—	31
Averages						
2011–2020	1,910	0	1,910	1,429	86	1,498
2016–2020	707	0	707	804	14	815

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Year	District 6				Upper Yukon management area subtotals			
	Subsistence	Commercial ^c	Personal use	Total	Subsistence	Commercial ^c	Personal use	Total
2001	8,966	–	34	9,000	18,906	–	34	18,940
2002	9,499	–	20	9,519	12,598	–	20	12,618
2003	10,363	15,119	549	26,031	20,023	15,486	549	36,058
2004	11,584	18,649	233	30,466	17,773	18,649	233	36,655
2005	19,538	21,778	107	41,423	24,668	21,778	107	46,553
2006	10,571	11,137	279	21,987	15,652	11,137	279	27,068
2007	7,845	1,368	135	9,348	14,163	1,368	135	15,666
2008	8,428	2,408	50	10,886	13,121	2,499	50	15,670
2009	7,051	742	70	8,148	13,535	742 ^f	70	14,632
2010	5,555	1,700	1,062	8,317	10,889	1,700	1,062	13,651
2011	6,842	6,784	232	13,858	10,303	6,784	232	17,319
2012	9,540	5,335	100	14,975	16,188	5,969	100	22,257
2013	5,257	7,439	109	12,805	11,495	7,439	109	19,043
2014	7,911	1,286	174	9,371	13,003	1,286	174	14,463
2015	8,000	8,811	145	16,956	12,403	8,811	145	21,359
2016	4,537	20,551	266	25,354	6,224	20,605	266	27,095
2017	2,525 ^c	9,656 ^g	200 ^c	12,381	4,061 ^c	9,656 ^g	200 ^c	13,917
2018	53 ^c	4,314	0 ^c	4,367	2,941 ^c	4,314	0 ^c	7,255
2019	1,069 ^c	2,348	68 ^c	3,485	2,178 ^c	2,348	68 ^c	4,594
2020	591 ^c	–	79 ^c	670	923 ^c	–	79 ^c	1,002
2021	53 ^c	–	–	0	84 ^c	–	0 ^c	84
Averages								
2011–2020	4,633	7,392	137	11,422	7,972	7,468	137	14,830
2016–2020	1,755	9,217	123	9,251	3,265	9,231	123	10,773

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Year	Alaska Yukon management area totals						Canada: Yukon territories totals		
	Subsistence ^a	Commercial	Personal use	Test fish sales ^b	Sport fish	Total	Mainstem Yukon River ^h	Porcupine Aboriginal	Total
2001	22,168	—	34	—	1,202	23,404	0	0	0
2002	15,489	—	20	—	1,092	16,601	26	449	475
2003	23,872	25,243	549	0	1,477	51,141	7	523	530
2004	20,795	20,232	233	0	1,623	42,883	5	175	180
2005	27,250	58,311	107	0	627	86,295	0	11	11
2006	19,706	64,942	279	0	1,000	85,927	1	111	112
2007	19,624	44,575	135	0	597	64,931	2	500	502
2008	16,855	35,691	50	0	341	52,937	0	200	200
2009	16,006	8,318	70	0	964	25,643	0	0	0
2010	13,045	3,750	1,062	0	944	18,801	0	12	12
2011	12,344	76,303	232	0	463	89,342	0	63	63
2012	21,533	74,789	100	39	131	96,592	0	10	10
2013	14,457	66,203	109	1	266	81,036	0	10	10
2014	17,098	104,692	174	0	1,855	123,819	0	133	133
2015	18,107	129,700	145	8	593	148,553	0	0	0
2016	9,081	201,482	266 ^c	11	670	210,978	0	0	0
2017	7,302 ^c	138,915	200 ^c	63	291	146,771	0	71	71
2018	5,527 ^c	110,590	131 ^c	48	544	116,840	0	25	25
2019	5,819 ^c	58,591	68 ^c	40	72	64,590	0	0	0
2020	2,339 ^c	—	79 ^c	—	1,337	3,755	0	0	0
2021	296 ^c	—	0 ^c	—	— ⁱ	296	0	0	0
Averages									
2011–2020	11,392	106,807	150	23	622	108,228	0	31	31
2016–2020	6,077	127,395	149	41	583	108,587	0	19	19

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Year	Yukon River drainage (Alaska and Canada) totals					
	Subsistence ^{a,j}	Commercial	Personal use	Alaska test fish ^b	Sport fish	Total
2001	22,168	0	34	0	1,202	23,404
2002	15,938	17	20	0	1,101	17,076
2003	24,395	25,243	549	0	1,484	51,671
2004	20,970	20,236	233	0	1,624	43,063
2005	27,261	58,311	107	0	627	86,306
2006	19,817	64,942	279	0	1,001	86,039
2007	20,124	44,575	135	0	599	65,433
2008	17,055	35,691	50	0	341	53,137
2009	16,006	8,318	70	0	964	25,643
2010	13,057	3,750	1,062	0	944	18,813
2011	12,407	76,303	232	0	463	89,405
2012	21,543	74,789	100	39	131	96,602
2013	14,467	66,203	109	1	266	81,046
2014	17,231	104,692	174	0	1,855	123,952
2015	18,107	129,700	145	8	593	148,553
2016	8,815	201,482	266	11	670	211,244
2017	7,373 ^c	138,915	200 ^c	63	291	146,842
2018	5,552 ^c	110,590	131 ^c	48	544	116,865
2019	5,819 ^c	58,591	68 ^c	40	72	64,590
2020	2,922 ^c	–	79 ^c	0	1,337	4,338
2021	296 ^c	–	0 ^c	–	– ⁱ	296
Averages						
2011–2020	15,428	106,807	171	21	622	108,344
2016–2020	8,815	127,395	266	32	583	108,776

Note: En dashes (–) = no data. NA indicates insufficient data to calculate averages. Commercial totals include coho salmon sold during summer season.

^a Includes harvest from the Coastal District communities of Hooper Bay and Scammon Bay.

^b The number of fish sold by ADF&G test fisheries.

^c Data are preliminary.

^d No commercial sales in District 3 from 1991 to 2019.

^e Harvest reports in numbers of fish sold in the round. Includes estimated number of females to produce roe sold in years with roe sales.

^f Includes harvest sold in the round and an estimated 285 females harvested for 258 pounds of roe.

^g Includes 220 headed and gutted fish sold and used to produce 126 pounds of roe sold.

^h Includes domestic, commercial, test, sport, and Aboriginal harvest from the mainstem Yukon River.

ⁱ Data are unavailable.

^j Includes Alaska Yukon River subsistence harvest and Canada Aboriginal harvest.

Appendix C6.–Yukon management area pink salmon total utilization in numbers of fish, by district and area, 2001–2021.

	Coastal District	District 1			District 2			District 3	Lower Yukon management area subtotals		
Year	Subsistence ^a	Subsistence	Commercial	Total	Subsistence	Commercial	Total	Subsistence ^a	Subsistence	Commercial	Total
2001	394	9	–	9	0	–	0	0	403	0	403
2002	5,892	1,028	0	1,028	1,282	0	1,282	0	8,202	0	8,202
2003	1,470	207	0	207	117	0	117	130	1,924	0	1,924
2004	7,926	615	0	615	1,138	0	1,138	6	9,685	0	9,685
2005	2,505	390	0	390	232	0	232	0	3,127	0	3,127
2006	2,814	1,114	0	1,114	900	0	900	25	4,853	0	4,853
2007	1,548	382	0	382	185	0	185	3	2,118	0	2,118
2008	3,779	3,053	13,391	16,444	1,025	709	1,734	456	8,313	14,100	22,413
2009	2,143	132	0	132	15	0	15	9	2,299	0	2,299
2010	2,464	787	0	787	1,049	0	1,049	2	4,302	0	4,302
2011	2,098	53	0	53	125	0	125	9	2,285	0	2,285
2012	2,444	1,619	0	1,619	880	0	880	100	5,043	0	5,043
2013	809	115	0	115	140	0	140	12	1,076	0	1,076
2014	2,635	3,292	49,317	52,609	920	5,434	6,354	11	6,858	54,751	61,609
2015	1,865	388	7,326	7,714	363	52	415	0	2,616	7,378	9,994
2016	6,497	1,795	125,070	126,865	258	2,268	2,526	11	8,561	127,338	135,899
2017	1,324 ^b	743 ^b	0	743	375 ^b	0	375	2 ^b	2,444 ^b	0	2,444
2018	2,923 ^b	444 ^b	38,456 ^c	38,900	304 ^b	787	1,091	0 ^b	3,671 ^b	39,243	42,914
2019	3,715 ^b	880 ^b	10,647	11,527	352 ^b	315	667	2 ^b	4,949 ^b	10,962	15,911
2020	4,580 ^b	1,547 ^b	4,845	6,392	723 ^b	0	723	37 ^b	6,887 ^b	4,845	11,732
2021	1803 ^b	556 ^b	–	556	291 ^b	–	291	0 ^b	2,650 ^b	0 ^b	2,650
Averages											
Odd years	1,787	330	1,997	2,127	190	41	227	17	2,324	1,834	4,158
Even years	4,195	1,529	23,108	24,637	848	920	1,768	65	6,638	24,028	30,665
2011–2020	2,889	1,088	23,566	24,654	444	886	1,330	18	4,439	24,452	28,891
2016–2020	3,808	1,082	35,804	36,885	402	674	1,076	10	5,302	36,478	41,780

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Year	District 4	District 5	District 6	Upper Yukon management area subtotals	Alaska Yukon management area totals			
	Subsistence ^a	Subsistence ^a	Subsistence ^a	Subsistence	Subsistence	Commercial	Sport fish	Total
2001	0	0	0	0	403	—	0	403
2002	221	0	0	221	8,423	0	0	8,423
2003	243	0	0	243	2,167	0	24	2,191
2004	12	0	0	12	9,697	0	33	9,730
2005	7	0	0	7	3,134	0	0	3,134
2006	1	0	0	1	4,854	0	54	4,908
2007	0	0	0	0	2,118	0	0	2,118
2008	1,023	276	0	1,299	9,612	14,100	0	23,712
2009	2	0	0	2	2,301	0	0	2,301
2010	0	0	0	0	4,302	0	0	4,302
2011	40	0	0	40	2,325	0	0	2,325
2012	104	3	0	107	5,150	0	51	5,201
2013	0	0	0	0	1,076	0	0	1,076
2014	66	8	0	74	6,932	54,751	0	61,683
2015	16	13	0	29	2,645	7,378	136	10,159
2016	117	34	0	151	8,863	127,338	70	136,271
2017	13 ^b	0 ^b	0 ^b	13 ^b	2,457 ^b	0	0	2,457
2018	41 ^b	0 ^b	0 ^b	41 ^b	3,712 ^b	39,243	19	42,974
2019	82 ^b	0 ^b	0 ^b	82 ^b	5,031 ^b	10,962	0	15,993
2020	8 ^b	0 ^b	0 ^b	8 ^b	7,581 ^b	4,845	0	12,426
2021	0 ^b	0 ^b	0 ^b	0 ^b	2,650 ^b	—	— ^d	2,650
Averages								
Odd years	40	1	0	42	2,366	2,038	16	4,216
Even years	159	32	0	191	6,913	24,028	23	30,963
2011–2020	49	6	0	55	4,577	24,452	28	29,057
2016–2020	52	7	0	59	5,529	36,478	18	42,024

Note: En dashes (–) = no data due to no fishing activity. NA indicates insufficient data to calculate averages.

^a No commercial or commercial related harvest of pink salmon in this district from 1998–2018.

^b Data are preliminary.

^c Includes test fish sale of pink salmon. One pink salmon was sold in during fall season in 2018.

^d Data are unavailable at this time.

Appendix C7.—Reported harvest of salmon and other fish species from subsistence permits issued in the Yukon and Koyukuk rivers, 2011–2021.

Year	Number of permits		Percent returned	Number reporting harvest	Reported harvest									
	Issued	Returned			Chinook	Summer chum	Fall chum	Coho	Whitefish	Sheefish	Burbot	Northern pike	Longnose sucker	Arctic grayling
2011	192	190	99%	118	4,319	1,568	20,498	3	723	70	17	119	160	395
2012	164	161	98%	86	1,809	544	20,566	26	713	100	21	32	21	59
2013	122	118	97%	71	1,183	1,649	21,715	150	285	37	15	23	39	107
2014	100	98	98%	53	77	461	20,355	1	738	201	8	37	10	67
2015	106	105	99%	55	792	570	21,719	2	487	143	14	76	7	96
2016	146	146	100%	101	2,835	770	19,231	141	671	53	9	52	10	55
2017 ^a	156	156	100%	120	6,022	1,760	24,395	113	870	114	19	53	6	49
2018 ^a	170	168	99%	123	3,659	623	22,092	94	903	90	38	42	5	42
2019 ^a	207	200	97%	109	5,374	224	21,318	514	1,417	68	26	76	12	81
2020 ^a	204	198	97%	95	2,608	85	618	60	2,717	253	20	192	4	34
2021 ^a	145	141	97%	36	385	15	5	23	799	55	16	15	26	46
Averages														
2011–2020	157	154	98%	93	2,868	825	19,251	110	952	113	19	70	27	99
2016–2020	177	174	99%	110	4,100	692	17,531	184	1,316	116	22	83	7	52

Note: Reported information from permits issued in the Yukon River (portions of Subdistricts 5-C and 5-D) and the South Fork of the Koyukuk River. Data may have been updated from previous annual reports.

^a Data are preliminary.

Appendix C8.—Reported harvest of salmon and other fish species from subsistence permits issued in Subdistricts 6-A, 6-B, and 6-D of the Tanana River, 2011–2021.

Year	Number of permits			Number reporting harvest	Reported harvest									
	Issued		Percent returned		Chinook	Summer chum	Fall chum	Coho	Whitefish	Sheefish	Burbot	Northern pike	Longnose sucker	Arctic grayling
	Salmon	Northern pike												
2011	157	70	98%	114	1,015	825	12,726	6,124	4,122	32	122	210	118	80
2012	169	73	91%	109	603	494	12,881	8,099	3,281	47	47	795	142	45
2013	166	77	94%	112	366	1,094	11,425	5,190	2,386	10	52	377	190	100
2014	123	106	98%	124	272	712	11,902	7,526	2,864	11	19	611	91	16
2015	128	120	100%	120	356	234	9,273	7,815	3,004	22	9	814	28	34
2016	110	201	97%	181	636	96	3,701	3,048	2,620	16	34	1,131	23	1
2017 ^a	106	93	100%	92	657	734	4,419	2,515	1,393	13	12	224	8	0
2018 ^a	138	175	99%	158	493	306	9,233	2,661	1,596	9	31	1,114	31	19
2019 ^a	159	245	98%	209	624	385	4,704	1,069	2,103	95	11	1,869	13	23
2020 ^a	165	329	97%	240	425	115	202	591	3,237	56	109	2,526	164	5
2021 ^a	113	425	98%	286	1	0	17	53	2,282	18	74	3,544	19	9
Averages														
2011–2020	142	149	97%	146	545	500	8,047	4,464	2,661	31	45	967	81	32
2016–2020	136	209	98%	176	567	327	4,452	1,977	2,190	38	39	1,373	48	10

Note: Reported information from permits issued in the Tanana River includes the Kantishna River and Tolovana River northern pike fishery. Data may have been updated from previous annual reports.

^a Data are preliminary.

Appendix C9.—Chinook salmon subsistence harvest totals by fishing district and community of residence, as estimated from postseason survey, returned permits and test fishery projects, and personal use harvest total for District 6, Yukon management area, 2011–2021.

Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015	2016–2020
												Average	Average
Hooper Bay	252	1,090	1,210	455	534	284	320	456	784	436	13	708	456
Scammon Bay	517	1,014	332	108	432	602	733	661	1,233	935	17	481	833
Coastal District total	769	2,104	1,542	563	966	886	1,053	1,117	2,017	1,371	30	1,189	1,289
Nunam Iqua	250	195	12	62	210	190	235	78	470	381	78	146	271
Alakanuk	1,464	1,081	275	214	436	465	846	424	1,818	1,394	229	694	989
Emmonak	2,172	1,864	553	463	612	939	1,732	1,211	2,419	1,033	346	1,133	1,467
Kotlik	2,369	1,173	794	617	661	1,158	1,767	1,556	2,333	912	78	1,123	1,545
District 1 total	6,255	4,313	1,634	1,356	1,919	2,752	4,580	3,269	7,040	3,720	731	3,095	4,272
Mountain Village	1,340	1,078	258	163	382	809	825	659	1,247	1,025	152	644	913
Pitkas Point	2,686	1,409	328	128	128	156	1,612	914	1,096	249	13	936	805
St. Mary's	2,063	1,789	266	178	370	1,032	1,118	1,030	2,735	1,480	220	933	1,479
Pilot Station	246	261	37	79	44	652	507	365	1,919	1,034	321	133	895
Marshall	1,734	2,344	215	68	261	512	961	1,180	1,261	938	9	924	970
District 2 total	8,069	6,881	1,104	616	1,185	3,161	5,023	4,148	8,258	4,726	715	3,571	5,063
Russian Mission	1,550	1,711	236	16	365	321	1,368	1,043	1,561	432	24	776	945
Holy Cross	2,231	576	204	0	68	557	836	562	1,483	192	–	616	726
Shageluk	353	75	4	32	14	23	92	198	262	90	–	96	133
Other District 3 ^b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9	NA	NA
District 3 total	4,134	2,362	444	48	447	901	2,296	1,803	3,306	714	33	1,487	1,804
Lower Yukon River total	18,458	13,556	3,182	2,020	3,551	6,814	11,899	9,220	18,604	9,160	1,479	8,153	11,139
Anvik	1,052	435	121	0	58	241	731	566	655	246	–	333	488
Grayling	1,374	1,081	226	3	22	370	751	911	1,446	264	–	541	748
Kaltag	2,488	1,346	348	10	119	1,358	2,048	570	1,225	577	–	862	1,156
Nulato	1,538	1,955	602	0	33	1,957	2,269	1,282	2,396	1,604	–	826	1,902
Koyukuk	1,349	614	898	52	26	612	648	864	1,088	268	–	588	696
Galena	1,434	742	275	1	372	993	2,246	1,254	2,895	695	2	565	1,617
Ruby	482	1,316	357	6	68	344	593	1,137	1,036	562	–	446	734
Other District 4 ^c	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND
District 4 subtotal	9,717	7,489	2,827	72	698	5,875	9,286	6,584	10,741	4,216	4	4,161	7,340

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Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015 Average	2016–2020 Average
Huslia/Hughes	131	165	68	51	38	94	462	150	871	186	0	91	353
Allakaket/Alatna/Bettles	45	8	6	9	35	46	35	49	134	176	0	21	88
Koyukuk River subtotal	176	173	74	60	73	140	497	199	1,005	362	0	111	441
District 4 total (incl. Koyukuk R.)	9,893	7,662	2,901	132	771	6,015	9,783	6,783	11,746	4,578	4	4,272	7,781
Tanana	2,936	2,100	1,200	88	141	2,129	2,962	5,253	3,408	1,956	72	1,293	3,142
Rampart/Stevens Village	616	520	274	0	1	228	155	178	446	507	5	282	303
Fairbanks (FNSB) ^d	2,186	558	610	14	263	1,318	2,521	1,342	2,479	1,623	315	726	1,857
Beaver	356	71	107	0	69	165	609	328	1,413	304	13	121	564
Fort Yukon/Birch Creek	2,521	2,141	1,561	93	480	1,226	4,302	4,547	4,563	752	5	1,359	3,078
Circle/Central	363	346	178	0	185	260	714	575	694	175	5	214	484
Eagle	728	167	175	76	395	864	1,730	1,007	790	280	38	308	934
Other District 5 ^e	777	477	125	0	7	306	860	404	944	368	22	277	576
District 5 subtotal	10,483	6,380	4,230	271	1,541	6,495	13,853	13,634	14,737	5,965	475	4,581	10,937
Venetie/Chalkyitsik	10	86	311	17	308	586	670	443	678	32	0	146	482
Teedriinjik/Draanjik R. subtotal	10	86	311	17	308	586	670	443	678	32	0	146	482
District 5 total	10,493	6,466	4,541	288	1,849	7,081	14,523	14,077	15,415	5,997	475	4,727	11,419
Manley	287	174	165	92	121	230	103	190	94	33	–	168	130
Minto	61	99	60	0	23	35	101	–	31	5	0	49	43
Nenana/Healy	681	296	87	139	263	464	429	323	404	230	6	293	370
Fairbanks (FNSB) ^f	330	58	49	41	33	143	145	53	59	140	–	102	108
Other District 6 ^g	8	0	6	11	0	1	0	49	9	17	1	5	15
District 6 Tanana R. total	1,367	627	367	283	440	816	778	615	597	425	7	617	646
Upper Yukon River total	21,753	14,755	7,809	703	3,060	13,912	25,084	21,475	27,758	11,000	486	9,616	19,846
Yukon management area total	40,980	30,415	12,533	3,286	7,577	21,612	38,036	31,812	48,379	21,531	1,995	18,958	32,274
Personal Use (District 6) ^h	89	71	42	1	5	57	125	201	244	112	0	42	148
Yukon management area total with Personal Use	41,069	30,486	12,575	3,287	7,582	21,669	38,161	32,013	48,623	21,643	1,995	19,000	32,422

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Note: En dashes (–) indicate data are not available due to confidentiality. ND indicates no data. NA indicates insufficient data to generate an average.

- ^a Data are preliminary.
- ^b Included District 3 survey communities combined to preserve confidentiality.
- ^c Included District 4 survey communities combined to preserve confidentiality.
- ^d Harvests by subsistence permit holders residing in Fairbanks who fished in District 5 near the Yukon River bridge crossing.
- ^e Other permit holders who fished in District 5 but did not reside in the communities listed.
- ^f Harvests by subsistence permit holders residing in Fairbanks who fished in the Tanana River.
- ^g Other permit holders who fished in District 6 but did not reside in the communities listed.
- ^h Harvest from the personal use fishing area on the Tanana River near Fairbanks. Not included in communities or totals above.

Appendix C10.—Summer chum salmon subsistence harvest totals by fishing district and community of residence, as estimated from postseason survey, returned permits and test fishery projects, and personal use harvest total for District 6, Yukon management area, 2011–2021.

Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015	2016–2020
												Average	Average
Hooper Bay	13,460	15,799	13,629	13,236	11,870	6,324	7,969	8,332	2,999	3,450	290	13,599	5,815
Scammon Bay	4,845	7,442	9,506	6,068	8,598	5,520	6,036	7,019	4,037	3,776	13	7,292	5,278
Coastal District total	18,305	23,241	23,135	19,304	20,468	11,844	14,005	15,351	7,036	7,226	303	20,891	11,092
Nunam Iqua	2,077	1,977	2,651	2,010	2,239	2,130	1,759	1,549	1,105	1,071	16	2,191	1,523
Alakanuk	7,447	9,012	7,520	9,120	4,469	6,527	5,035	5,632	6,276	3,924	66	7,514	5,479
Emmonak	12,468	15,829	8,209	7,143	9,973	8,976	6,937	7,094	8,404	5,463	170	10,724	7,375
Kotlik	6,598	8,552	10,136	5,621	4,960	8,925	8,776	7,007	6,994	4,831	102	7,173	7,307
District 1 total	28,590	35,370	28,516	23,894	21,641	26,558	22,507	21,282	22,779	15,289	354	27,602	21,683
Mountain Village	4,182	5,716	5,299	5,728	4,702	8,782	5,031	4,401	4,342	3,180	39	5,125	5,147
Pitkas Point	3,810	5,903	3,986	6,189	4,351	1,485	5,300	3,311	1,103	478	21	4,848	2,335
St. Mary's	9,355	9,031	11,861	7,059	6,063	7,379	7,593	5,347	7,349	4,030	74	8,674	6,340
Pilot Station	585	1,153	2,186	1,588	1,225	4,796	1,623	1,390	6,871	3,881	344	1,347	3,712
Marshall	6,760	10,763	9,167	5,570	8,216	5,180	5,147	4,586	2,703	2,076	11	8,095	3,938
District 2 total	24,692	32,566	32,499	26,134	24,557	27,622	24,694	19,035	22,368	13,645	489	28,090	21,473
Russian Mission	1,225	2,508	3,967	3,181	2,626	1,798	2,645	2,245	1,483	574	49	2,701	1,749
Holy Cross	363	1,147	262	97	421	991	245	303	199	174	–	458	382
Shageluk	1,145	5,035	463	470	80	275	870	506	673	113	–	1,439	487
Other District 3 ^b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	NA	NA
District 3 total	2,733	8,690	4,692	3,748	3,127	3,064	3,760	3,054	2,355	861	81	4,598	2,619
Lower Yukon River total	74,320	99,867	88,842	73,080	69,793	69,088	64,966	58,722	54,538	37,021	1,227	81,180	56,867
Anvik	220	1,371	830	2,052	777	1,117	330	437	223	120	–	1,050	445
Grayling	838	2,616	618	1,617	509	878	738	792	879	58	–	1,240	669
Kaltag	163	186	67	954	216	467	193	25	180	288	–	317	231
Nulato	246	254	401	158	6	1,001	1,414	248	157	40	–	213	572
Koyukuk	890	828	4,459	300	0	119	96	150	21	24	–	1,295	82
Galena	3,414	718	179	377	1,059	1,689	1,229	303	1,223	58	0	1,149	900
Ruby	775	3,891	681	29	88	678	115	993	464	0	–	1,093	450
Other District 4 ^c	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	NA	NA
District 4 subtotal	6,546	9,864	7,235	5,487	2,655	5,949	4,115	2,948	3,147	588	0	6,357	3,349

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Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015 Average	2016–2020 Average
Huslia/Hughes	4,120	7,734	4,070	3,214	4,609	4,764	9,540	3,726	3,915	1,804	2	4,749	4,750
Allakaket/Alatna/Bettles	2,500	3,957	2,456	1,280	2,513	3,015	2,872	4,820	472	1,705	0	2,541	2,577
Koyukuk River subtotal	6,620	11,691	6,526	4,494	7,122	7,779	12,412	8,546	4,387	3,509	2	7,291	7,327
District 4 total (incl. Koyukuk R.)	13,166	21,555	13,761	9,981	9,777	13,728	16,527	11,494	7,534	4,097	2	13,648	10,676
Tanana	4,381	4,333	9,565	2,612	3,162	3,685	3,086	5,892	530	337	18	4,811	2,706
Rampart/Stevens Village	110	259	55	70	0	629	10	2	0	3	0	99	129
Fairbanks (FNSB) ^d	688	172	1,350	300	575	461	1,413	395	179	65	10	617	503
Beaver	393	27	12	0	0	23	102	8	27	0	0	86	32
Fort Yukon/Birch Creek	1,297	0	225	19	0	12	101	0	12	0	0	308	25
Circle/Central	48	0	66	0	0	0	0	0	0	0	0	23	0
Eagle	2	0	50	0	0	0	0	0	0	0	0	10	0
Other District 5 ^e	790	101	94	91	8	180	321	34	55	17	5	217	121
District 5 subtotal	7,709	4,892	11,417	3,092	3,745	4,990	5,033	6,331	803	422	33	6,171	3,516
Venetie/Chalkyitsik	0	0	0	16	0	0	0	114	0	0	0	3	23
Teedriinjik/Draanjik R. subtotal	0	0	0	16	0	0	0	114	0	0	0	3	23
District 5 total	7,709	4,892	11,417	3,108	3,745	4,990	5,033	6,445	803	422	33	6,174	3,539
Manley	142	58	45	182	9	32	16	70	3	7	–	87	26
Minto	27	64	258	24	0	4	234	–	0	1	0	75	60
Nenana/Healy	471	370	642	275	60	19	385	108	409	23	4	364	189
Fairbanks (FNSB) ^f	185	114	143	237	183	209	269	82	16	84	–	172	132
Other District 6 ^g	0	72	6	13	0	8	7	5	0	0	0	18	4
District 6 Tanana R. total	825	678	1,094	731	252	272	911	265	428	115	4	716	398
Upper Yukon River total	21,700	27,125	26,272	13,820	13,774	18,814	22,471	18,204	8,765	4,634	39	20,538	14,578
Yukon management area total	96,020	126,992	115,114	86,900	83,567	87,902	87,437	76,926	63,303	41,655	1,266	101,719	71,445
Personal Use (District 6) ^h	439	321	138	235	220	176	438	509	294	67	0	271	297
Yukon management area total with Personal Use	96,459	127,313	115,252	87,135	83,787	88,078	87,875	77,435	63,597	41,722	1,266	101,989	71,741

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Appendix C10.–Page 3 of 3.

Note: En dashes (–) indicate data are not available due to confidentiality. ND indicates no data. NA indicates insufficient data to generate an average.

- ^a Data are preliminary.
- ^b Included District 3 survey communities combined to preserve confidentiality.
- ^c Included District 4 survey communities combined to preserve confidentiality.
- ^d Harvests subsistence permit holders residing in Fairbanks who fished in District 5 near the Yukon River bridge crossing.
- ^e Other permit holders who fished in District 5 but did not reside in the communities listed.
- ^f Harvests by subsistence permit holders residing in Fairbanks who fished in the Tanana River.
- ^g Other permit holders who fished in District 6 but did not reside in the communities listed.
- ^h Harvest from the personal use fishing area on the Tanana River near Fairbanks. Not included in communities or totals above.

Appendix C11.–Fall chum salmon subsistence harvest totals by fishing district and community of residence, as estimated from postseason survey, returned permits and test fishery projects, and personal use harvest total for District 6, Yukon management area, 2011–2021.

Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015 Average	2016–2020 Average
Hooper Bay	267	1	91	137	79	105	139	158	210	407	28	122	138
Scammon Bay	48	10	58	115	119	657	422	367	605	264	11	60	434
Coastal District total	315	11	149	252	198	762	561	525	815	671	39	183	572
Nunam Iqua	51	210	93	128	210	111	52	188	102	16	3	125	133
Alakanuk	881	449	328	593	1,067	743	426	520	352	108	22	622	622
Emmonak	1,540	5,890	2,165	2,465	3,244	2,501	2,739	2,213	1,868	1,331	117	2,756	2,513
Kotlik	962	1,073	1,087	886	1,356	1,217	1,370	759	1,929	139	1	898	1,326
District 1 total	3,434	7,622	3,673	4,072	5,877	4,572	4,587	3,680	4,251	1,594	143	4,401	4,593
Mountain Village	575	1,031	777	796	1,346	1,210	1,070	1,127	1,185	259	137	802	1,188
Pitkas Point	562	184	853	1,100	1,731	232	536	415	139	72	0	551	611
St. Mary's	800	685	2,174	1,484	1,398	1,088	1,617	875	844	125	2	1,055	1,164
Pilot Station	30	9	65	400	172	903	172	112	997	468	296	103	471
Marshall	611	1,423	1,009	2,037	1,611	1,106	780	475	644	13	0	1,093	923
District 2 total	2,578	3,332	4,878	5,817	6,258	4,539	4,175	3,004	3,809	937	435	3,605	4,357
Russian Mission	11	282	804	365	449	235	671	349	469	0	0	313	435
Holy Cross	94	339	855	1,840	763	583	329	174	171	26	–	630	404
Shageluk	249	16	105	252	176	179	304	183	114	0	–	364	191
Other District 3 ^b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	NA	NA
District 3 total	354	637	1,764	2,457	1,388	997	1,304	706	754	26	0	1,307	1,030
Lower Yukon River total	6,366	11,591	10,315	12,346	13,523	10,108	10,066	7,390	8,814	2,557	578	9,313	9,980
Anvik	202	569	763	1,028	680	527	296	500	45	226	–	546	410
Grayling	1,152	804	471	1,451	1,184	499	272	774	45	54	–	816	555
Kaltag	196	2,830	583	2,828	1,255	680	149	66	103	0	–	1,419	451
Nulato	652	2,729	2,995	3,839	2,248	2,681	1,748	882	662	0	–	2,253	1,644
Koyukuk	1,388	1,331	5,308	998	2,838	297	166	301	287	0	–	1,963	778
Galena	2,739	2,947	602	3,368	2,542	3,319	4,774	1,393	1,129	19	0	2,325	2,631
Ruby	592	4,408	2,505	972	713	526	104	842	242	0	–	1,901	485
Other District 4 ^c	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	NA	NA
District 4 subtotal	6,921	15,618	13,227	14,484	11,460	8,529	7,509	4,758	2,513	299	0	11,223	6,954

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Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015 Average	2016–2020 Average
Huslia/Hughes	247	1,911	1,257	927	1,226	954	552	659	420	28	0	949	762
Allakaket/Alatna/Bettles	92	526	707	525	588	551	1,548	362	1,299	42	0	474	870
Koyukuk River subtotal	339	2,437	1,964	1,452	1,814	1,505	2,100	1,021	1,719	70	0	1,423	1,632
District 4 total (incl. Koyukuk R.)	7,260	18,055	15,191	15,936	13,274	10,034	9,609	5,779	4,232	369	0	12,646	8,586
Tanana	21,728	20,465	31,546	14,131	19,627	21,261	21,957	17,451	12,039	1,103	59	20,571	18,467
Rampart/Stevens Village	1,251	467	940	6,700	186	4,500	0	1,417	98	20	4	2,560	1,240
Fairbanks (FNSB) ^d	1,696	793	1,160	1,406	2,454	2,143	3,075	2,023	4,113	568	1	1,175	2,762
Beaver	122	174	21	323	76	228	0	142	17	0	0	135	93
Fort Yukon/Birch Creek	7,188	12,659	16,453	8,025	6,257	7,728	3,696	3,105	7,153	133	7	10,066	5,590
Circle/Central	299	161	1,397	1,277	1,652	1,306	2,182	1278	2069	9	0	812	1,697
Eagle	17,455	18,731	18,871	17,450	17,185	15,765	19,126	16,807	16,738	0	0	17,503	17,124
Other District 5 ^e	208	443	121	222	229	17	12	124	52	21	0	223	87
District 5 subtotal	49,947	53,893	70,509	49,534	47,666	52,948	50,048	42,347	42,279	1,854	71	53,046	47,059
Venetie/Chalkyitsik	1,938	457	5,589	1,663	2,594	5,883	10,390	2,544	2,792	43	0	2,527	4,841
Teedriinjik/Draanjik R. subtotal	1,938	457	5,589	1,663	2,594	5,883	10,390	2,544	2,792	43	0	2,527	4,841
District 5 total	51,885	54,350	76,098	51,197	50,260	58,831	60,438	44,891	45,071	1,897	71	55,573	51,900
Manley	2,333	2,164	1,539	2,579	1,697	414	809	2,365	2,457	172	–	2,262	1,548
Minto	1,500	2	593	472	140	40	18	–	11	0	0	527	52
Nenana/Healy	6,218	9,260	3,852	4,545	3,981	3,544	2,460	2,779	1,801	19	17	6,349	2,913
Fairbanks (FNSB) ^f	4,317	3,876	5,651	5,190	3,496	884	1,114	765	658	10	–	3,942	1,440
Other District 6 ^g	8	0	5	12	31	0	18	0	3	1	0	20	10
District 6 Tanana R. total	14,376	15,302	11,640	12,798	9,345	4,882	4,419	5,909	4,930	202	17	13,101	5,954
Upper Yukon River total	73,521	87,707	102,929	79,931	72,879	73,747	74,466	56,579	54,233	2,468	88	81,320	66,439
Yukon management area total	80,202	99,309	113,393	92,529	86,600	84,617	85,093	64,494	63,862	5,696	705	90,816	76,992
Personal Use (District 6) ^h	347	410	383	278	80	283	626	514	408	37	0	925	382
Yukon management area total with personal use	80,549	99,719	113,776	92,807	86,680	84,900	85,719	65,008	64,270	5,733	705	91,741	77,374

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Note: En dashes (–) indicate data are not available due to confidentiality. ND indicates no data. NA indicates insufficient data to generate an average.

- ^a Data are preliminary.
- ^b Included District 3 survey communities combined to preserve confidentiality.
- ^c Included District 4 survey communities combined to preserve confidentiality.
- ^d Harvests by Fairbanks subsistence permit holders who fished in District 5 near the Yukon River bridge crossing.
- ^e Other permit holders who fished in District 5 but did not reside in the communities listed.
- ^f Harvests by Fairbanks subsistence permit holders who fished in the Tanana River.
- ^g Other permits holders who fished in District 6 but did not reside in the communities listed.
- ^h Harvest from the personal use fishing area on the Tanana River near Fairbanks. Not included in communities or totals above.

Appendix C12.–Coho salmon subsistence harvest totals by fishing district and community of residence, as estimated from postseason survey, returned permits and test fishery projects, and personal use harvest total for District 6, Yukon management area, 2011–2021.

Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015 Average	2016–2020 Average
Hooper Bay	0	7	73	118	95	121	222	117	342	150	41	59	190
Scammon Bay	55	86	214	86	79	234	213	754	462	200	9	104	373
Coastal District total	55	93	287	204	174	355	435	871	804	350	50	163	563
Nunam Iqua	23	18	83	153	229	58	20	184	21	19	4	101	60
Alakanuk	431	252	167	443	581	183	201	188	380	123	8	375	215
Emmonak	472	2,660	517	613	852	717	723	330	379	331	21	1,023	496
Kotlik	201	420	457	573	438	273	102	264	1,182	79	3	418	380
District 1 total	1,127	3,350	1,224	1,782	2,100	1,231	1,046	966	1,962	552	36	1,917	1,151
Mountain Village	145	329	136	568	305	436	91	122	274	126	37	297	210
Pitkas Point	150	567	508	468	1,511	22	140	112	0	10	0	641	57
St. Mary's	261	256	271	202	723	128	769	270	10	37	0	343	243
Pilot Station	37	53	41	123	72	136	40	54	147	174	74	65	110
Marshall	230	141	124	408	391	409	223	37	212	147	15	259	206
District 2 total	823	1,346	1,080	1,769	3,002	1,131	1,263	595	643	494	126	1,604	825
Russian Mission	0	319	152	124	154	6	483	123	104	7	0	150	145
Holy Cross	0	237	0	103	246	134	0	23	63	6	–	117	45
Shageluk	36	0	219	113	28	0	14	8	65	7	–	79	19
Other District 3 ^b	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	NA	NA
District 3 total	36	556	371	340	428	140	497	154	232	20	0	346	209
Lower Yukon River total	1,986	5,252	2,675	3,891	5,530	2,502	2,806	1,715	2,837	1,066	162	3,867	2,185
Anvik	19	214	97	197	46	184	11	15	55	21	–	115	57
Grayling	119	26	34	403	212	35	0	0	75	52	–	159	32
Kaltag	258	928	306	514	18	53	4	34	1	0	–	405	18
Nulato	118	41	125	454	48	0	82	223	27	0	–	157	66
Koyukuk	137	62	3,267	50	416	1	6	24	38	0	–	786	14
Galena	1,013	276	170	718	654	201	136	216	120	13	0	566	137
Ruby	312	1,806	345	335	185	226	24	26	32	0	–	597	62
Other District 4 ^c	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	NA	NA
District 4 subtotal	1,976	3,353	4,344	2,671	1,579	700	263	538	348	86	0	2,785	387

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Community	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	2011–2015 Average	2016–2020 Average
Huslia/Hughes	83	165	360	282	310	93	174	980	80	45	0	240	274
Allakaket/Alatna/Bettles	13	38	236	109	52	33	92	27	69	5	0	90	45
Koyukuk River subtotal	96	203	596	391	362	126	266	1,007	149	50	0	330	320
District 4 total (incl. Koyukuk R.)	2,072	3,556	4,940	3,062	1,941	826	529	1,545	497	136	0	3,114	707
Tanana	312	3,060	1,135	1,788	2,434	639	874	1,343	82	120	8	1,746	612
Rampart/Stevens Village	0	0	0	0	2	52	0	0	7	12	21	0	14
Fairbanks (FNSB) ^d	2	0	0	0	0	101	112	0	506	32	2	0	150
Beaver	0	2	0	2	0	0	0	0	0	0	0	1	0
Fort Yukon/Birch Creek	1,040	4	7	201	2	1	4	0	4	0	0	251	2
Circle/Central	0	5	150	0	0	38	0	0	0	0	0	31	8
Eagle	1	0	0	1	0	0	0	0	0	0	0	0	0
Other District 5 ^e	0	21	0	0	0	0	1	0	1	16	0	4	4
District 5 subtotal	1,355	3,092	1,292	1,992	2,438	831	991	1,343	600	180	31	2,034	789
Venetie/Chalkyitsik	34	0	6	38	24	30	16	0	12	16	0	20	15
Teedriinjik/Draanjik R. subtotal	34	0	6	38	24	30	16	0	12	16	0	20	15
District 5 total	1,389	3,092	1,298	2,030	2,462	861	1,007	1,343	612	196	31	2,054	804
Manley	1,482	1,374	447	1,177	1,263	323	750	0	381	330	–	1,149	357
Minto	0	0	266	37	270	0	0	–	0	0	0	115	0
Nenana/Healy	4,248	6,664	1,962	3,002	3,359	2,970	1,402	0	475	180	49	3,847	1,005
Fairbanks (FNSB) ^f	1,109	1,502	2,576	3,689	3,108	1,244	362	53	213	81	–	2,397	391
Other District 6 ^g	3	0	6	6	0	0	11	0	0	0	4	3	2
District 6 Tanana R. total	6,842	9,540	5,257	7,911	8,000	4,537	2,525	53	1,069	591	53	7,510	1,755
Upper Yukon River total	10,303	16,188	11,495	13,003	12,403	6,224	4,061	2,941	2,178	923	84	12,678	3,265
Yukon management area total	12,344	21,533	14,457	17,098	18,107	8,815	7,302	5,527	5,819	2,339	296	16,708	5,960
Personal Use (District 6) ^h	232	100	109	174	145	266	200	0	68	79	0	152	123
Yukon management area total with personal use	12,576	21,633	14,566	17,272	18,252	9,081	7,502	5,527	5,887	2,418	296	16,860	6,083

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Note: En dashes indicate data are not available due to confidentiality. ND indicates no data. NA indicates insufficient data to generate an average.

- ^a Data are preliminary.
- ^b Included District 3 survey communities combined to preserve confidentiality.
- ^c Included District 4 survey communities combined to preserve confidentiality.
- ^b Harvests by Fairbanks subsistence permit holders who fished in District 5 near the Yukon River bridge crossing.
- ^c Other permit holders who fished in District 5 but did not reside in the communities listed.
- ^d Harvests by Fairbanks subsistence permit holders who fished in the Tanana River.
- ^e Other permits holders who fished in District 6 but did not reside in the communities listed.
- ^f Harvest from the personal use fishing area on the Tanana River near Fairbanks. Not included in communities or totals above.

Appendix C13.–Pink salmon subsistence harvest totals by fishing district and community of residence, as estimated from postseason survey, returned permits and test fishery projects, and personal use harvest total for District 6, Yukon management area, 2011–2021.

Community	2011 ^a	2012 ^a	2013	2014 ^a	2015	2016	2017 ^{a, b}	2018 ^{a, b}	2019 ^{a, b}	2020 ^{a, b}	2021 ^{a, b}	Estimated total		
												Even years average	Odd years average	All years average
Hooper Bay	210	1,101	302	712	451	4,007	319	635	2,393	1,758	1,079	1,643	735	1,189
Scammon Bay	1,888	1,343	507	1,923	1,414	2,490	1,005	2,288	1,322	2,328	724	2,074	1,227	1,651
Coastal District	2,098	2,444	809	2,635	1,865	6,497	1,324	2,923	3,715	4,580	1,803	3,816	1,962	2,889
Nunam Iqua	8	1,051	0	670	352	352	484	377	269	1,031	260	696	223	459
Alakanuk	13	174	92	970	15	713	100	7	190	254	155	424	82	253
Emmonak	0	199	0	588	7	228	0	31	23	162	141	242	6	124
Kotlik	32	195	23	1,064	14	502	159	29	398	100	0	378	125	252
District 1 total	53	1,619	115	3,292	388	1,795	743	444	880	1,547	556	1,739	436	1,088
Mountain Village	24	207	0	233	57	93	148	94	270	449	11	215	100	158
Pitkas Point	0	2	2	45	288	48	0	122	0	22	205	48	58	53
St. Mary's	1	643	0	614	18	104	176	35	80	235	75	326	55	191
Pilot Station	34	23	131	27	0	8	5	0	1	13	0	14	34	24
Marshall	66	5	7	1	0	5	46	53	1	4	0	14	24	19
District 2 total	125	880	140	920	363	258	375	304	352	723	291	617	271	444
Russian Mission	0	76	12	8	0	0	0	0	0	0	0	17	2	10
Holy Cross	0	0	0	0	0	2	1	0	0	0	–	0	0	0
Shageluk	9	24	0	3	0	9	1	0	2	37	–	15	2	9
Other District 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	NA	NA	NA
District 3 total	9	100	12	11	0	11	2	0	2	37	0	25	5	15
Anvik	0	0	0	0	0	0	0	0	0	8	–	2	0	1
Grayling	40	0	0	39	0	33	0	16	0	0	–	18	8	13
Kaltag	0	0	0	0	0	73	0	0	0	0	–	15	0	7
Nulato	0	0	0	8	0	0	0	0	0	0	–	2	0	1
Koyukuk	0	0	0	0	0	0	0	0	0	0	–	0	0	0
Galena	0	3	0	6	16	11	8	0	0	0	0	4	5	4
Ruby	0	0	0	13	0	0	0	0	0	0	–	3	0	1
Hughes/Huslia	0	101	0	0	0	0	5	20	82	0	0	24	17	21
Allakaket/Alatna/Bettles	0	0	0	0	0	0	0	5	0	0	0	1	0	1
Other District 4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	NA	NA	NA
District 4 total	40	104	0	66	16	117	13	41	82	8	0	67	30	49

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Community	2011 ^a	2012 ^a	2013	2014 ^a	2015	2016	2017 ^{a, b}	2018 ^{a, b}	2019 ^{a, b}	2020 ^{a, b}	2021 ^{a, b}	Estimated total		
												Even years average	Odd years average	All years average
Tanana	0	3	0	8	13	34	0	0	0	0	0	9	3	6
Stevens Village	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Beaver	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fort Yukon/Birch Creek	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Venetie/Chalkyitsik	0	0	0	0	0	0	0	0	0	0	0	0	0	0
District 5 total	0	3	0	8	13	34	0	0	0	0	0	9	3	6
Survey total	2,325	5,150	1,076	6,932	2,645	8,712	2,457	3,712	5,031	6,895	2,650	6,280	2,707	4,494
CI (95%)	918	918	918	1,356	612	2,064	748	1,093	1,210	1,841	713	1,454	881	1,168
Test fish ^b	34	216	0	120	0	9	7	65	2	15	1	85	9	47

Note: Averages do not include the current year. CI (95%) is the annual 95 percent confidence interval. En dashes indicate data are not available due to confidentiality. ND indicates no data. NA indicates insufficient data to generate an average.

^a Includes pink salmon given to communities from test fishery projects.

^b Data are preliminary.

Appendix C14.—Reported harvest of salmon and other fish species from personal use permits issued in Subdistrict 6-C of the Tanana River, 2011–2021.

Year	Permits			Number reporting harvest	Reported harvest									
	Number issued		Percent returned		Chinook	Summer chum	Fall chum	Coho	Whitefish	Sheefish	Burbot	Northern pike	Longnose sucker	Arctic grayling
	Salmon	Whitefish ^a												
2011	67	7	97%	39	98	439	354	249	62	1	1	0	142	0
2012	60	12	97%	32	71	321	410	100	22	0	0	0	233	0
2013	53	14	99%	36	42	138	383	132	89	1	1	3	118	3
2014	50	21	100%	33	1	235	278	174	145	3	0	0	270	0
2015	42	22	100%	28	5	220	80	145	280	1	0	1	323	1
2016	57	21	100%	39	57	176	283	266	271	1	0	7	181	6
2017 ^b	82	14	100%	49	125	438	626	200	117	1	1	4	165	0
2018 ^b	99	16	100%	66	206	515	505	131	100	0	0	0	113	1
2019 ^b	92	15	97%	51	244	294	408	68	99	10	0	73	104	0
2020 ^b	82	28	99%	35	112	67	37	79	75	5	0	0	21	0
2021 ^b	45	25	99%	2	0	0	0	0	2	0	0	0	30	0
Averages														
2011–2020	68	17	99%	41	96	284	336	154	126	2	0	9	167	1
2016–2020	82	19	99%	48	149	298	372	149	132	3	0	17	117	1

Note: Reported information is from permits issued in the salmon and whitefish/sucker fishery (combined harvest). Data may have been updated from previous annual reports.

^a Whitefish and sucker fishery permits.

^b Data are preliminary.

Appendix C15.—Estimated and reported subsistence and personal use harvest of miscellaneous fish species, Yukon management area, 2011–2021.

	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	5-year Average 2011–2015	5-year Average 2016–2020
Survey estimates ^b													
Whitefish ^c	44,890	70,486	64,766	84,889	79,740	69,578	65,084	54,349	66,086	45,668	17,293	68,954	60,153
Northern pike	14,270	18,450	11,264	14,582	20,109	24,580	22,596	21,054	15,720	25,719	9,760	15,735	21,934
Sheefish	10,139	17,094	15,553	12,583	12,828	14,451	12,910	11,826	14,842	9,174	4,960	13,639	12,641
Survey reported													
Burbot	2,477	2,422	2,115	2,016	3,364	2,501	2,811	2,953	1,946	789	780	2,479	2,200
Arctic lamprey	6,037	1,243	2,608	19,888 ^d	42,237 ^d	17,609	19,357	952	4	0	0	3,296	7,584
Tomcod	6,797	4,023	5,221	10,020	4,697	5,795	6,661	5,143	10,006	1,252	707	6,152	5,771
Arctic grayling	1,273	2,674	1,435	1,772	1,832	1,518	1,452	1,808	744	228	283	1,797	1,150
Longnose suckers	286	95	180	90	ND	ND	ND	ND	ND	ND	ND	163	NA
Arctic char	205	216	167	ND	ND	ND	ND	ND	ND	ND	ND	196	NA
Alaska blackfish	87,064	62,731	63,235	92,080	97,586	90,207	109,888	61,896	88,009	24,135	16,669	80,539	81,168
Sockeye salmon	279	405	258	ND	ND	ND	ND	ND	ND	ND	ND	314	NA
Herring ^e	ND	10,449	9,082	17,164	24,591	15,959	16,492	25,907	12,267	5,917	5,289	15,322	15,449
Permit Reported													
Whitefish ^b	4,851	3,966	2,766	3,747	3,771	3,562	2,380	2,297	3,577	6,029	3,083	3,820	3,569
Northern pike	319	825	403	648	891	1,190	281	928	1,990	2,718	3,559	617	1,421
Sheefish	103	147	48	215	166	70	128	96	131	314	73	136	148
Burbot	140	58	68	27	23	43	32	69	22	129	90	63	59
Arctic grayling	475	104	210	83	131	62	49	62	100	39	55	201	62
Longnose suckers	414	396	347	371	358	214	179	66	45	189	75	377	139

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	2011	2012	2013	2014	2015	2016	2017 ^a	2018 ^a	2019 ^a	2020 ^a	2021 ^a	5-year Average 2011–2015	5-year Average 2016–2020
Yukon management area totals from subsistence survey communities and permit areas													
Whitefish ^b	49,741	74,452	67,532	88,636	83,511	73,140	67,464	56,646	69,663	51,697	20,376	72,774	63,722
Northern pike	14,589	19,275	11,667	15,230	21,000	25,770	22,877	21,982	17,710	28,437	13,319	16,352	23,355
Sheefish	10,242	17,241	15,601	12,798	12,994	14,521	13,038	11,922	14,973	9,488	5,033	13,775	12,788
Burbot	2,617	2,480	2,183	2,043	3,387	2,544	2,843	3,022	1,968	918	870	2,542	2,259
Arctic grayling	1,748	2,778	1,645	1,855	1,963	1,580	1,501	1,870	844	267	338	1,998	1,212
Longnose suckers	700	491	527	461	358	214	179	66	45	189	75	507	139

Note: ND indicates information was not collected. NA indicates insufficient data to generate an average.

^a Data are preliminary.

^b Subsistence whitefish, pike, and sheefish estimates in surveyed communities is based on a stratified random sample of households as designated for the estimation of subsistence salmon harvests and may not reflect harvest of those households targeting nonsalmon species.

^c Whitefish includes various *Coregonus* species and round whitefish (*Prosopium cylindraceum*).

^d Harvest of Arctic lamprey reported on postcards was incorporated into totals reported on surveys. This is the total number reported on surveys and postcards. Arctic lamprey estimates represent previous winter's harvest.

^e Starting in 2012, households in the lower Yukon including the Coastal District were asked about harvest of herring. Household responses for herring include smelt and unspecified species.

APPENDIX D: COMMERCIAL HARVEST

Appendix D1.—Guideline harvest ranges and mid-points for commercial harvest of Chinook, summer chum, and fall chum salmon, Yukon management area, Alaska, 2021.

Chinook salmon						
District or Subdistrict	Guideline harvest range ^a					
	Lower		Midpoint		Upper	
	Numbers	Percent	Numbers	Percent	Numbers	Percent
1 and 2	60,000	89.1	90,000	91.6	120,000	92.9
3	1,800	2.7	2,000	2.0	2,200	1.7
4	2,250	3.3	2,550	2.6	2,850	2.2
5-B, 5-C	2,400	3.6	2,600	2.6	2,800	2.2
5-D	300	0.4	400	0.4	500	0.4
6	600	0.9	700	0.7	800	0.6
Total	67,350	100.0	98,250	100.0	129,150	100.0

Summer chum salmon						
District or Subdistrict	Guideline harvest range ^b					
	Lower		Midpoint		Upper	
	Numbers	Percent	Numbers	Percent	Numbers	Percent
1 and 2	251,000	62.8	503,000	62.9	755,000	62.9
3	6,000	1.5	12,500	1.6	19,000	1.6
4-A ^c	113,000	28.2	225,500	28.2	338,000	28.2
4-B, 4-C	16,000	4.0	31,500	3.9	47,000	3.9
5-B, 5-C, 5-D	1,000	0.3	2,000	0.2	3,000	0.2
6	13,000	3.2	25,500	3.2	38,000	3.2
Total	400,000	100.0	800,000	100.0	1,200,000	100.0

Anvik River management area roe cap of 100,000 pounds. ^d

Fall chum salmon						
District or Subdistrict	Guideline harvest range ^e					
	Lower		Midpoint		Upper	
	Numbers	Percent	Numbers	Percent	Numbers	Percent
1, 2, and 3	60,000	82.5	140,000	71.2	220,000	68.6
4	5,000	6.9	22,500	11.4	40,000	12.5
5-B, 5-C	4,000	5.5	20,000	10.2	36,000	11.2
5-D	1,000	1.4	2,500	1.3	4,000	1.2
6	2,750	3.8	11,625	5.9	20,500	6.4
Total	72,750	100.0	196,625	100.0	320,500	100.0

Subdistrict 5-A range of 0 to 4,000 pounds of roe. ^f

^a The Chinook salmon guideline harvest ranges have been in effect since 1981.

^b Summer chum salmon guideline harvest ranges were established in February 1990 based on the average harvest shares from 1975–1989.

^c Or the equivalent roe poundage of 61,000 to 183,000 pounds or some combination of fish and pounds of roe.

^d The current Anvik River Management Area roe cap was established in March 1996.

^e The current fall chum salmon guideline harvest ranges were established in 1990.

^f Subdistrict 5-A was removed from the guideline harvest ranges for Chinook and summer chum salmon and a separate guideline harvest range of 0 to 4,000 pounds of fall chum salmon roe was established in November 1998.

Appendix D2.–Commercial fisheries entry commission (CFEC) salmon permits issued by gear type, Yukon management area, 2001–2021.

Year	Lower Yukon management area		Upper Yukon management area				Total	
	Set or drift gillnet		Set gillnet		Fish wheel			
	Permits issued ^a	Permits fished ^b	Permits issued ^a	Permits fished ^b	Permits issued ^a	Permits fished ^b	Permits issued ^a	Permits fished ^b
2001	700	0	72	0	156	0	928	0
2002	702	540	72	12	156	12	930	564
2003	703	557	72	7	157	20	932	584
2004	692	551	67	9	137	14	896	574
2005	691	581	67	6	135	15	893	602
2006	686	574	66	10	128	26	880	610
2007	684	566	66	6	124	24	874	596
2008	681	474	64	2	124	20	869	496
2009	678	391	61	2	122	10	861	403
2010	670	444	58	0	115	11	843	455
2011	665	437	55	0	115	9	835	446
2012	662	475	52	0	106	19	820	494
2013	653	451	51	0	103	16	807	467
2014	653	468	47	0	100	14	800	482
2015	649	480	46	0	98	6	793	486
2016	647	483	46	1	95	8	788	492
2017	647	457	46	1	93	18	786	476
2018	652	484	45	0	94	14	791	498
2019	634	417	43	0	90	7	767	424
2020	632	183	43	0	89	0	764	183
2021	625	0	43	0	88	0	756	0
Averages								
2011–2020	649	434	47	0	98	11	795	445
2016–2020	642	405	45	0	92	9	779	415

Note: In years with 3 or less permits fished, confidentiality waivers were obtained.

^a Information obtained from CFEC. Permits issued is the number of active permanent and interim permits.

^b Data obtained from OceanAK fish ticket database. Only permits that made at least 1 commercial delivery are included.

Appendix D3.—Number of commercial salmon fishing permit holders making at least 1 delivery by district and season, Yukon management area, 2001–2021.

Year	Chinook and summer chum salmon season								Yukon management area total
	Lower Yukon management area				Upper Yukon management area				
	District 1	District 2	District 3	Subtotal ^a	District 4	District 5	District 6	Subtotal	
2001 ^b	—	—	—	—	—	—	—	—	—
2002	322	223	0	540	0	18	6	24	564
2003	351	217	0	556	3	16	7	26	582
2004	396	212	0	549	0	14	6	20	569
2005	370	228	0	578	0	12	5	17	595
2006	379	214	6	569	0	15	10	25	594
2007	359	220	3	564	5	12	10	27	591
2008	266	181	0	444	8	0	5	13	457
2009	213	166	0	376	6	0	5	11	387
2010	264	181	0	440	5	0	5	10	450
2011	228	182	0	403	0	0	5	5	408
2012	242	178	0	413	11	0	3	14	427
2013	220	174	0	384	9	0	2	11	395
2014	231	183	0	405	10	0	1	11	416
2015	270	177	0	435	0	0	2	2	437
2016	245	198	0	435	0	0	2	2	437
2017	284	114	0	388	10	0	3	13	401
2018	264	167	0	417	8	0	1	9	426
2019	249	89	0	334	0	0	1	1	335
2020	151	36	0	183	—	—	—	—	183
2021 ^b	—	—	—	0	—	—	—	—	0
Averages									
2011–2020	238	150	0	380	5	0	2	8	387
2016–2020	239	121	0	351	5	0	2	6	356

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Year	Fall chum and coho salmon season								Yukon management area total
	Lower Yukon management area				Upper Yukon management area				
	District 1	District 2	District 3	Subtotal ^a	District 4	District 5	District 6	Subtotal	
2001 ^b	—	—	—	—	—	—	—	—	—
2002	0	0	0	0	0	0	0	0	0
2003	75	0	0	75	2	0	5	7	82
2004	26	0	0	26	0	0	6	6	32
2005	177	0	0	177	0	0	7	7	184
2006	219	71	0	286	0	4	11	15	301
2007	181	122	0	300	0	2	8	10	310
2008	251	177	0	428	0	3	8	11	439
2009	165	130	0	292	0	0	2	2	294
2010	72	18	0	90	0	0	4	4	94
2011	234	169	0	395	0	2	5	7	402
2012	267	201	0	449	4	3	5	13	462
2013	251	197	0	436	0	1	6	7	443
2014	256	199	0	441	0	2	2	4	445
2015	266	184	0	440	0	1	5	6	446
2016	275	197	0	459	0	4	4	8	467
2017	318	144	0	438	5	4	4	13	451
2018	284	172	0	448	4	3	3	10	458
2019	276	136	0	404	0	3	4	7	411
2020 ^b	—	—	—	—	—	—	—	—	—
2021 ^b	—	—	—	—	—	—	—	—	—
Averages									
2011–2020	270	178	0	434	1	3	4	8	443
2016–2020	288	162	0	437	2	4	4	10	447

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Year	Combined season ^c								Yukon management area total
	Lower Yukon management area				Upper Yukon management area				
	District 1	District 2	District 3	Subtotal ^a	District 4	District 5	District 6	Subtotal	
2001 ^b	—	—	—	—	—	—	—	—	—
2002	322	223	0	540	0	18	6	24	564
2003	358	217	0	557	3	16	8	27	584
2004	399	212	0	551	0	14	9	23	574
2005	392	228	0	581	0	12	9	21	602
2006	396	224	6	574	0	20	16	36	610
2007	366	236	3	566	5	13	12	30	596
2008	297	208	0	474	8	3	11	22	496
2009	226	172	0	391	6	0	6	12	403
2010	274	183	0	444	5	0	6	11	455
2011	260	201	0	437	0	2	7	9	446
2012	284	210	0	475	11	3	5	23	498
2013	264	211	0	451	9	1	6	16	467
2014	277	216	0	468	10	2	2	14	482
2015	299	207	0	480	0	1	5	6	486
2016	288	216	0	483	0	4	5	9	492
2017	338	157	0	457	10	4	5	19	476
2018	309	201	0	484	8	3	3	14	498
2019	294	143	0	417	0	3	4	7	424
2020	151	36	0	183	—	—	—	—	183
2021 ^b	—	—	—	—	—	—	—	—	—
Averages									
2011–2020	276	180	0	434	5	3	5	13	445
2016–2020	276	151	0	405	5	4	4	12	415

Note: En dashes (–) indicate no fishing activity occurred.

^a Since 1984, the subtotal for the lower Yukon management area was the unique number of permits fished. Some individual stakeholders in the lower Yukon management area may have operated in more than one district during the year.

^b No commercial fishing.

^c Combined seasons numbers will differ as the data represent the total number of unique permits fished during the entire season.

Appendix D4.—Estimated average price per pound paid to harvesters, Yukon management area, 2001–2021.

Year	Lower Yukon management area price per pound (dollars)					Upper Yukon management area price per pound (dollars)							
	Chinook	Summer chum	Fall chum	Coho	Pink	Chinook	Chinook roe	Summer chum	Summer chum roe	Fall chum	Fall chum roe	Coho	Coho roe
2001	—	—	—	—	—	—	—	—	—	—	—	—	—
2002	3.77	0.06	—	—	—	0.75	1.75	0.32	2.25	—	—	—	—
2003	2.37	0.05	0.15	0.10	—	0.80	—	0.27	—	0.10	—	0.05	—
2004	2.80	0.05	0.25	0.05	—	0.77	—	0.27	—	0.05	—	0.06	—
2005	3.43	0.05	0.32	0.32	—	0.87	—	0.25	—	0.14	—	0.12	—
2006	3.94	0.05	0.20	0.20	—	1.30	—	0.16	—	0.14	—	0.19	—
2007	3.73	0.19	0.27	0.39	—	1.33	—	0.25	2.36	0.20	—	0.20	—
2008	4.64	0.40	0.55	0.97	0.10	—	—	0.25	3.00	0.27	—	0.20	—
2009	5.00	0.50	0.70	1.00	—	—	—	0.26	3.00	0.19	—	0.15	—
2010	5.00	0.70	1.00	1.50	—	—	—	0.23	—	0.23	—	0.26	—
2011	5.00 ^a	0.75	1.00	1.00	—	—	—	0.26	—	0.22	—	0.15	—
2012	—	0.75	1.00	1.25	—	—	—	0.37	—	0.19	—	0.25	—
2013	—	0.75	0.75	1.10	—	—	—	0.30	—	0.16	—	0.17	—
2014	—	0.60	0.75	1.00	0.07	—	—	0.29	—	0.25	—	0.38	—
2015	—	0.60	0.60	0.70	0.12	—	—	0.23	—	0.14	—	0.12	—
2016	—	0.60	0.68	1.00	0.14	—	—	0.26	—	0.14	—	0.13	—
2017	5.50 ^a	0.60	0.60	1.00	—	—	—	0.34	—	0.15	1.84	0.15	2.00
2018	—	0.60	0.78	1.00	0.15	—	—	0.33	—	0.13	—	0.15	—
2019	6.65	0.60	0.60	1.00	0.10	—	—	0.29	—	0.17	—	0.21	—
2020	—	0.60	—	—	0.04	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—	—
Averages													
2011–2020	5.72	0.65	0.75	1.01	0.10	NA	NA	0.30	NA	0.17	NA	0.19	NA
2016–2020	6.08	0.60	0.67	1.00	0.11	NA	NA	0.31	NA	0.15	NA	0.16	NA

Note: En dashes (—) indicate no data. NA indicates insufficient data to calculate average.

^a Chinook salmon sold in fall season only.

Appendix D5.–Value of commercial salmon fishery (in dollars) to Yukon management area harvesters, 2001–2021.

Year	Summer season							
	Chinook			Summer chum			Pink	Total summer season ^a
	Lower Yukon value	Upper Yukon value	Subtotal	Lower Yukon value	Upper Yukon value	Subtotal	Lower Yukon value	
2001	–	–	–	–	–	–	–	–
2002	1,781,996	20,744	1,802,740	4,342	6,176	10,518	–	1,813,258
2003	1,871,202	40,957	1,912,159	1,585	6,879	8,464	–	1,920,623
2004	3,063,667	38,290	3,101,957	8,884	9,645	18,529	–	3,120,486
2005	1,952,109	24,415	1,976,524	11,004	13,479	24,483	–	2,001,007
2006	3,290,367	32,631	3,322,998	23,862	42,988	66,850	–	3,389,848
2007	1,939,114	27,190	1,966,304	220,715	34,421	255,136	–	2,221,440
2008	325,470	–	325,470	326,930	65,840	392,770	4,656	718,240
2009	20,970	–	20,970	514,856	20,430	535,286	–	556,256
2010	639,230	–	639,230	823,967	61,534	885,501	–	1,524,731
2011	4,925	–	4,925 ^b	1,301,008	12,966	1,313,974	–	1,318,899
2012	–	–	–	980,424	137,817	1,118,241	–	1,118,241
2013	–	–	–	1,721,524	152,110	1,873,634	–	1,873,634
2014	–	–	–	1,648,866	154,959	1,803,825	13,672	1,817,593
2015	–	–	–	1,259,908	7,166	1,267,074	1,674	1,269,200
2016	–	–	–	1,903,490	6,030	1,909,520	54,800	1,964,341
2017	9,922	–	9,922 ^b	1,470,353	276,682	1,747,035	–	1,756,957
2018	–	–	–	1,679,448	217,064	1,896,512	15,989	1,912,514
2019	251,673	–	251,673 ^c	820,654	2,819	823,473	3,384	1,078,530
2020	–	–	–	51,022	0	51,022	373	51,395
2021	–	–	–	–	–	–	–	–
Averages								
2011–2020	88,840	NA	88,840	1,283,670	96,761	1,380,431	14,982	1,416,130
2016–2020	130,798	NA	130,798	1,184,993	100,519	1,285,512	18,636	1,352,747

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Year	Fall season								
	Fall chum			Coho			Pink	Total fall season	Total value (both seasons)
	Lower Yukon value	Upper Yukon value	Subtotal	Lower Yukon value	Upper Yukon value	Subtotal	Lower Yukon value		
2001	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	1,813,258
2003	5,993	3,398	9,391	18,168	5,095	23,263	—	32,654	1,953,277
2004	1,126	848	1,974	2,774	6,372	9,146	—	11,120	3,131,606
2005	316,698	48,159	364,857	83,793	19,182	102,975	—	467,832	2,468,839
2006	202,637	33,806	236,443	50,299	11,137	61,436	—	297,879	3,687,727
2007	144,256	16,907	161,163	127,869	1,368	129,237	—	290,400	2,511,840
2008	428,969	22,089	451,058	216,777	3,717	220,494	—	671,552	1,389,792
2009	108,778	1,286	110,064	52,176	457	52,633	—	162,697	718,953
2010	5,428	2,761	8,189	20,535	442	20,977	—	29,166	1,553,897
2011	1,628,329	16,115	1,644,444	472,199	6,792	478,991	—	2,123,435	3,442,334
2012	1,385,498	28,355	1,413,853	534,523	7,428	541,951	—	1,955,804	3,074,045
2013	1,154,172	25,744	1,179,916	453,998	7,115	461,113	—	1,641,029	3,514,663
2014	621,975	8,156	630,131	706,569	2,380	708,949	19	1,339,099	3,156,692
2015	762,142	15,683	777,825	616,165	6,877	623,042	2,017	1,402,884	2,672,084
2016	2,093,566	22,477	2,116,043	1,143,823	15,540	1,159,363	8,863	3,284,269	5,248,610
2017	2,038,232	29,176	2,067,408	814,580	8,778	823,358	—	2,890,766	4,647,722
2018	2,113,465	17,933	2,131,398	677,191	3,688	680,879	8	2,812,284	4,724,798
2019	1,054,751	18,395	1,073,146	336,578	2,371	338,949	—	1,412,094	2,490,624
2020	—	—	—	—	—	—	—	—	51,395
2021	—	—	—	—	—	—	—	—	—
Averages									
2011–2020	1,428,015	20,226	1,448,240	639,514	6,774	646,288	2,727	2,095,740	3,302,297
2016–2020	1,825,004	21,995	1,846,999	743,043	7,594	750,637	4,435	2,599,853	3,432,630

Note: En dashes indicate no data. NA indicates insufficient data to calculate average.

^a Since 2014, the value includes coho salmon sold during the summer season.

^b Sale of Chinook salmon only occurred in fall season.

^c Sale of Chinook salmon occurred during summer and fall season.

Appendix D6.—Commercial Chinook salmon harvest (in numbers of fish) for fall and summer seasons combined by statistical area, lower Yukon management area, 2001–2021.

Year	District 1									Total
	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	334-19 ^a	
2001	—	—	—	—	—	—	—	—	—	—
2002	1,001	1,271	449	742	2,993	69	2,338	2,224	—	11,087
2003	1,601	4,714	1,089	1,514	4,756	437	3,518	5,080	—	22,709
2004	975	2,505	1,965	1,502	4,285	1,783	9,270	6,118	—	28,403
2005	2,137	1,531	944	592	2,580	1,650	3,926	3,334	—	16,694
2006	2,252	2,106	1,558	928	3,507	2,476	6,201	4,720	—	23,748
2007	1,116	1,419	1,555	855	4,890	1,168	5,828	1,785	—	18,616
2008	50	440	209	263	372	226	628	342	—	2,530
2009	1	16	4	3	36	17	10	3	—	90
2010	252	824	213	358	1,266	985	1,570	276	—	5,744
2011	1	8	1	0	4	17	4	1	—	36
2012	0	0	0	0	0	0	0	0	—	0
2013	0	0	0	0	0	0	0	0	—	0
2014	0	0	0	0	0	0	0	0	—	0
2015	0	0	0	0	0	0	0	0	—	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	26	4	13	51	46	28	0	0	168
2018	0	0	0	0	0	0	0	0	0	0
2019	0	280	152	72	552	370	500	165	9	2,100
2020	0	0	0	0	0	0	0	0	0	0
2021	—	—	—	—	—	—	—	—	—	—
Averages										
2011–2020	0	31	16	9	61	43	53	17	2	230
2016–2020	0	61	31	17	121	83	106	33	2	454

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Year	District 2						District 3		
	334-21	334-22	334-23	334-24	334-25	Total	334-31	334-32	Total
2001	–	–	–	–	–	–	–	–	–
2002	2,140	3,044	1,992	2,712	1,546	11,434	–	–	–
2003	2,965	5,454	993	2,104	2,704	14,220	–	–	–
2004	5,879	8,326	3,459	3,819	2,662	24,145	–	–	–
2005	3,292	5,905	1,397	347	2,472	13,413	–	–	–
2006	3,750	8,457	2,700	3,425	1,511	19,843	315	0	315
2007	2,818	5,509	2,458	1,375	1,146	13,306	190	0	190
2008	420	654	670	252	115	2,111	–	–	–
2009	39	106	56	2	23	226	–	–	–
2010	389	1,690	890	1,184	0	4,153	–	–	–
2011	2	16	6	22	0	46	–	–	–
2012	0	0	0	0	0	0	–	–	–
2013	0	0	0	0	0	0	–	–	–
2014	0	0	0	0	0	0	–	–	–
2015	0	0	0	0	0	0	–	–	–
2016	0	0	0	0	0	0	–	–	–
2017	0	0	0	0	0	0	–	–	–
2018	0	0	0	0	0	0	–	–	–
2019	109	309	437	154	1	1,010	–	–	–
2020	0	0	0	0	0	0	–	–	–
2021	–	–	–	–	–	–	–	–	–
Averages									
2011–2020	11	33	44	18	0	106	NA	NA	NA
2016–2020	22	62	87	31	0	202	NA	NA	NA

Note: En dashes (–) indicate no data. NA indicates insufficient data to calculate averages. ADF&G test fishery sales not included. Values include Chinook salmon harvested in both summer and fall seasons.

^a Statistical area 334-19 was created in 2016.

Appendix D7.–Commercial summer chum salmon harvest (in numbers of fish) by statistical area, lower Yukon.

Year	District 1								Total
	334-11 and -12 ^a	334-13	334-14	334-15	334-16	334-17	334-18	334-19 ^b	
2001	0	–	–	–	–	–	–	–	–
2002	1,496	374	1,519	858	4	1,277	799	–	6,327
2003	678	117	292	690	188	566	1,048	–	3,579
2004	1,552	1,446	904	2,694	870	4,171	2,356	–	13,993
2005	7,051	1,658	2,697	3,631	1,985	3,970	2,973	–	23,965
2006	7,491	1,915	899	2,315	1,441	4,382	3,373	–	21,816
2007	19,414	14,297	10,746	15,816	8,801	25,753	11,963	–	106,790
2008	10,416	5,521	9,224	6,219	5,937	17,423	12,719	–	67,459
2009	8,187	9,120	9,569	12,979	4,930	23,532	3,018	–	71,335
2010	23,019	5,707	12,405	12,116	9,484	32,994	6,542	–	102,267
2011	28,865	20,807	39,517	19,948	10,720	35,634	7,948	–	163,439
2012	47,336	21,516	25,364	1,126	432	53,037	1,989	–	150,800
2013	55,166	20,303	35,431	19,303	6,198	67,662	3,808	–	207,871
2014	69,081	14,698	27,699	12,182	761	61,940	11,879	–	198,240
2015	51,938	8,485	19,045	17,974	7,414	47,244	20,539	–	172,639
2016	64,512	31,585	29,592	27,717	20,964	105,501	13,651	0	293,522
2017	60,312	20,718	31,578	34,659	31,913	138,283	27,932	0	345,395
2018	62,234	33,782	15,188	25,173	10,286	81,152	22,388	755	250,958
2019	5,400	6,463	6,185	58,833	36,668	56,748	13,361	0	183,658
2020	1,234	842	549	1,660	253	4,561	462	39	9,600
2021	–	–	–	–	–	–	–	–	–
Averages									
2011–2020	44,608	17,920	23,015	21,858	12,561	65,176	12,396	159	197,612
2016–2020	38,738	18,678	16,618	29,608	20,017	77,249	15,559	159	216,627

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Year	District 2					District 3 (334-31)		
	334-21 and -22 ^a	334-23	334-24	334-25	Total	Number	Roe	Estimated harvest ^c
2001	0	—	—	—	0	—	—	—
2002	2,102	862	794	269	4,027	—	—	—
2003	2,008	218	181	176	2,583	—	—	—
2004	3,163	1,350	1,061	208	5,782	—	—	—
2005	6,830	850	105	528	8,313	—	—	—
2006	16,848	2,080	5,805	810	25,543	116	0	116
2007	53,939	9,310	1,740	4,443	69,432	1	0	1
2008	29,343	16,781	10,145	1,870	58,139	—	—	—
2009	62,154	19,717	3,053	1,647	86,571	—	—	—
2010	32,604	14,474	33,870	0	80,948	—	—	—
2011	43,068	20,506	37,868	1,629	103,071	—	—	—
2012	33,081	12,317	11,651	0	57,049	—	—	—
2013	107,120	29,860	34,292	0	171,272	—	—	—
2014	117,401	50,069	61,637	0	229,107	—	—	—
2015	90,023	43,855	38,827	8,742	181,447	—	—	—
2016	125,002	42,503	50,073	10,689	228,267	—	—	—
2017	37,734	3,925	5,218	893	47,770	—	—	—
2018	92,506	42,456	56,309	4,152	195,423	—	—	—
2019	19,180	13,098	9,557	0	41,835	—	—	—
2020	1,329	1,571	1,455	0	4,355	—	—	—
2021	—	—	—	—	—	—	—	—
Averages								
2011–2020	66,644	26,016	30,689	2,611	125,960	NA	NA	NA
2016–2020	55,150	20,711	24,522	3,147	103,530	NA	NA	NA

Note: En dashes indicate no data. NA indicates insufficient data to calculate average. ADF&G test fishery sales not included.

^a Combined Statistical Areas 334-11 and 334-12 in District 1, and 334-21 and 334-22 in District 2 for confidentiality.

^b Statistical Area 334-19 was created in 2016.

^c Estimated harvest includes both males and females harvested to produce roe sold.

Appendix D8.—Average weight of salmon (in pounds) harvested in the commercial fishery, Yukon management area, 2001–2021.

Year	Lower Yukon management area					Upper Yukon management area			
	Chinook	Summer chum	Fall chum	Coho	Pink	Chinook	Summer chum	Fall chum	Coho
2001	—	—	—	—	—	—	—	—	—
2002	19.9	7.2	—	—	—	15.9	6.0	—	—
2003	21.4	7.3	7.2	7.4	—	14.6	6.1	6.1	6.0
2004	20.8	6.9	6.8	7.0	—	13.8	5.7	4.9	5.7
2005	18.9	6.8	7.8	7.1	—	14.6	6.0	7.1	6.9
2006	19.0	6.8	7.2	6.2	—	13.1	6.1	7.0	5.1
2007	17.9	6.5	7.1	7.5	—	13.5	5.8	5.4	5.0
2008	14.1	6.6	7.2	6.8	3.3	—	7.3	7.8	7.6
2009	13.3	6.5	6.6	6.9	—	—	5.4	5.2	6.8
2010	12.9	6.4	6.7	6.7	—	—	5.3	6.9	6.0
2011 ^a	12.0	6.5	7.1	6.8	—	—	5.7	6.8	6.5
2012	—	6.3	6.9	6.2	—	—	4.6	7.0	5.0
2013	—	6.1	7.2	7.0	—	—	4.8	6.2	5.6
2014	—	6.4	7.5	6.8	3.5	—	5.2	7.0	4.8
2015	—	5.9	7.3	7.3	4.0	—	6.5	6.7	6.2
2016	—	6.1	7.0	6.3	3.5	—	5.9	6.3	5.9
2017	10.7	6.2	7.3	6.3	—	—	5.0	7.1	5.9
2018	—	6.3	7.4	6.4	2.7	—	5.0	7.4	5.8
2019	12.2	6.1	7.0	6.0	3.1	—	6.0	6.4	4.7
2020	—	6.1	—	—	1.9	—	—	—	—
2021	—	—	—	—	—	—	—	—	—
Averages									
2011–2020	11.6	6.2	7.2	6.6	3.1	NA	5.4	6.8	5.6
2016–2020	11.5	6.2	7.2	6.2	2.8	NA	5.5	6.8	5.6

Note: En dashes indicate no commercial fishing activity occurred. NA indicates insufficient data to generate average. Data obtained from weight samples or from fish ticket information.

^a Beginning in 2011, commercial gillnets were reduced to a maximum of 7.5-inch mesh by regulation. Management actions from 2008–2019 restrict commercial gillnets to 6-inch or smaller during the summer season.

Appendix D9.—Commercial catches of Chinook and summer chum salmon by gear, and incidental harvests of Chinook salmon, Districts 1 and 2, lower Yukon management area, 2001–2021.

Year	Summer season gillnet		Selective gear ^a	Chinook released alive ^b		Chinook retained ^c		Fall season Chinook Districts 1 and 2 ^d		Total Chinook harvest ^e
	Chinook sold	Summer chum sold	Summer chum sold	Dist. 1	Dist. 2	Dist. 1	Dist. 2	Sold	Retained	
2001 ^f	—	—	—	—	—	—	—	—	—	—
2002 ^f	22,529	10,354	—	0	0	0	0	0	0	22,529
2003 ^f	36,928	6,162	—	0	0	0	0	1	0	36,929
2004 ^f	52,546	19,775	—	0	0	0	0	2	0	52,548
2005 ^f	30,032	32,278	—	0	0	0	0	75	0	30,107
2006 ^g	43,562	47,359	—	0	0	0	0	29	0	43,591
2007 ^g	31,917	176,222	—	0	0	0	0	5	0	31,922
2008 ^h	4,348	125,598	—	0	0	0	0	293	0	4,641
2009 ^h	131	157,906	—	0	0	944	2,596	185	0	3,856
2010 ^h	9,897	183,215	—	0	0	0	0	0	0	9,897
2011 ^h	0	266,510	—	0	0	2,090	2,000	82	66	4,238
2012 ^h	0	207,849	—	0	0	1,756	665	0	103	2,524
2013 ^{h, i}	0	189,935	189,208	302	627	195	244	0	44	483
2014 ^h	0	154,498	272,849	1,934	3,505	126	314	0	30	470
2015 ^{h, i}	0	126,872	227,214	4,578	4,935	1,810	1,479	0	98	3,387
2016 ^{h, i}	0	340,643	181,146	4,175	4,068	2,781	2,548	0	114	5,443
2017 ^{h, i}	0	258,122	135,043	3,881	742	5,512	77	168	225	5,982
2018 ^h	0	202,570	243,811	5,859	6,069	1,595	1,447	0	148	3,190
2019 ^h	2,582	225,493	0	0	0	1,092	56	528	0	4,258
2020 ^h	0	5,219	8,736	403	392	362	0	0	0	362
2021	—	—	—	—	—	—	—	—	—	—
Averages										
2011–2020	258	197,771	157,251	2,113	2,034	1,732	883	78	83	3,034
2016–2020	516	206,409	113,747	2,864	2,254	2,268	826	139	97	3,847

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Note: ADF&G test fish sales are not included. En dashes indicate no data.

- ^a In 2013, the BOF adopted new selective gear types (dip nets and beach seines) for use in the summer chum-directed commercial fishery.
- ^b During openings with selective gear, all Chinook must be released alive, these are recorded on a fish ticket.
- ^c During gillnet openings, Chinook salmon may be retained for personal use, or sold (when sales are allowed).
- ^d The fall chum salmon commercial fishery does not allow selective gear, therefore Chinook salmon were either sold or retained from gillnets. This fishery is restricted to maximum 7.5-inch mesh gillnets in most years and begins when over 99% of the Chinook salmon run is complete.
- ^e All Chinook salmon retained or sold in the chum-directed commercial fishery (beginning in 2008) are considered incidental harvest.
- ^f During the summer season (early June to mid-July) primarily 8- to 8.5-inch mesh size used. Mesh size was formally restricted in the commercial fishery in 2010 when the Board of Fisheries restricted the maximum mesh size to 7.5 inches.
- ^g In 2006 and 2007, Harvest includes 7.5-inch mesh and 6-inch mesh openings.
- ^h Summer chum fishery was restricted to 6-inch or smaller mesh gillnets. Chinook harvest was incidental.
- ⁱ Some periods restricted to 5.5-inch gillnets with a maximum depth of 30 inches during the summer chum fishery.

Appendix D10.—Commercial summer chum salmon sales and estimated harvest by statistical area, Subdistrict 4—A, upper Yukon management area, 2001–2021.

Year	334-44			334-45			334-46			Total		
	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	—	—	—	—	—	—	—	—	—
2004	—	—	—	—	—	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—	—	—	—	—	—
2006	—	—	—	—	—	—	—	—	—	—	—	—
2007 ^d	5,359	—	5,359	—	—	—	1,945	—	1,945	7,304	—	7,304
2008 ^d	—	—	—	—	—	—	23,746	—	23,746	23,746	—	23,746
2009 ^d	3,890	—	3,890	699	—	699	—	—	—	4,589	—	4,589
2010 ^e	—	—	—	—	—	—	44,207	—	44,207	44,207	—	44,207
2011	—	—	—	—	—	—	—	—	—	—	—	—
2012 ^e	—	—	—	—	—	—	108,222	—	108,222	108,222	—	108,222
2013 ^e	—	—	—	—	—	—	100,507	—	100,507	100,507	—	100,507
2014 ^e	—	—	—	—	—	—	96,385	—	96,385	96,385	—	96,385
2015	—	—	—	—	—	—	—	—	—	—	—	—
2016	—	—	—	—	—	—	—	—	—	—	—	—
2017 ^e	—	—	—	—	—	—	159,051	—	159,051	159,051	—	159,051
2018 ^e	—	—	—	—	—	—	126,892	—	126,892	126,892	—	126,892
2019	—	—	—	—	—	—	—	—	—	—	—	—
2020	—	—	—	—	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—
Averages												
2011–2020	NA	NA	NA	NA	NA	NA	118,211	NA	118,211	118,211	NA	118,211
2016–2020	NA	NA	NA	NA	NA	NA	142,972	NA	142,972	142,972	NA	142,972

Note: En dashes indicate no data. NA indicates insufficient data to calculate average.

^a Reported as numbers of fish sold in the round.

^b Pounds of salmon roe sold. Since 1990, efforts were made to separate Chinook salmon roe from summer chum salmon roe.

^c From 1990–2006, the estimated harvest is the number of fish sold in the round plus the estimated number of females and the estimated number of unsold males harvested to produce the roe sold. Beginning in 2007, the actual numbers of female fish from which roe were extracted are included in the total harvest. Males were recorded as caught but not sold, and thus are accounted for in personal use totals.

^d The number of female fish from which roe were extracted is the number harvested. Males were not purchased and are accounted for in personal use totals.

^e Both males and females were purchased and are included in the number harvested.

Appendix D11.—Commercial summer chum salmon sales and estimated harvest by statistical area, District 6, upper Yukon management area, 2001–2021.

Year	334-61			334-62			334-63			Total		
	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	0	0	0	2,711	16	2,731	487	0	487	3,198	16	3,218
2003	0	0	0	3,953	0	3,953	508	0	508	4,461	0	4,461
2004	0	0	0	2,447	0	2,447	4,163	0	4,163	6,610	0	6,610
2005	0	0	0	5,404	0	5,404	3,582	0	3,582	8,986	0	8,986
2006	0	0	0	37,758	0	37,758	6,863	0	6,863	44,621	0	44,621
2007	0	0	0	10,627	0	10,627	4,047	0	4,047	14,674	0	14,674
2008	0	0	0	1,194	0	1,194	648	4	652	1,842	4	1,846
2009	590	0	590	4,979	0	4,979	2,208	0	2,208	7,777	0	7,777
2010	0	0	0	5,466	0	5,466	0	0	0	5,466	0	5,466
2011	0	0	0	4,964	0	4,964	3,687	0	3,687	8,651	0	8,651
2012	0	0	0	3,151	0	3,151	353	0	353	3,504	0	3,504
2013	0	0	0	5,937	0	5,937	0	0	0	5,937	0	5,937
2014	0	0	0	6,912	0	6,912	0	0	0	6,912	0	6,912
2015	0	0	0	4,589	0	4,589	181	0	181	4,770	0	4,770
2016	0	0	0	4,020	0	4,020	0	0	0	4,020	0	4,020
2017	0	0	0	4,300	0	4,300	0	0	0	4,300	0	4,300
2018	0	0	0	3,427	0	3,427	0	0	0	3,427	0	3,427
2019	0	0	0	1,596	0	1,596	0	0	0	1,596	0	1,596
2020	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0
Averages												
2011–2020	0	0	0	3,890	0	3,890	422	0	422	4,312	0	4,312
2016–2020	0	0	0	2,669	0	2,669	0	0	0	2,669	0	2,669

Note: En dashes indicate no data.

^a Reported as numbers of fish sold in the round.

^b Pounds of salmon roe sold. Since 1990, efforts were made to separate Chinook salmon roe from summer chum salmon roe.

^c The estimated harvest is the fish sold in the round plus the estimated number of females to produce the roe sold. Since 1990, the estimated number of females that produce the roe sold is based on a District 6 sampling program that estimated average roe weight per female by period.

Appendix D12.—Commercial fall chum salmon harvest (in numbers of fish) by statistical area, lower Yukon management area, 2001–2021.

Year	District 1									District 2				
	334-11 and -12 ^a	334-13	334-14	334-15	334-16	334-17	334-18	334-19 ^b	Total	334- 21&22 ^a	334-23	334-24	334-25	Total
2001	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2003	2,784	177	310	958	0	381	976	—	5,586	—	—	—	—	—
2004	509	25	67	0	0	19	40	—	660	—	—	—	—	—
2005	16,957	8,735	25,330	8,253	31,864	29,546	9,840	—	130,525	—	—	—	—	—
2006	16,375	9,929	9,973	7,538	9,568	32,200	15,671	—	101,254	24,431	11,060	4,414	0	39,905
2007	6,395	8,550	4,951	1,423	2,130	12,562	2,841	—	38,852	25,687	8,245	1,894	0	35,826
2008	16,493	6,018	9,138	5,152	7,090	16,072	7,741	—	67,704	21,657	11,507	7,424	682	41,270
2009	1,421	457	301	4,576	2,118	2,415	623	—	11,911	9,095	1,593	235	1,149	12,072
2010	211	0	13	83	10	167	61	—	545	30	165	0	75	270
2011	10,030	3,673	10,142	34,153	35,432	27,230	7,075	—	127,735	47,878	18,123	32,063	2,667	100,731
2012	36,766	4,039	12,305	23,870	11,351	37,810	13,701	—	139,842	49,112	26,646	53,526	0	129,284
2013	21,428	7,304	11,192	12,175	5,484	43,824	5,181	—	106,588	46,139	16,379	40,955	2,801	106,274
2014	9,167	2,659	6,092	6,193	2,643	19,391	5,684	—	51,829	25,061	11,186	22,891	0	59,138
2015	30,864	6,032	6,450	13,118	11,488	26,401	6,209	—	100,562	28,883	21,486	22,702	1,143	74,214
2016	63,453	15,780	19,998	19,537	13,461	68,882	25,465	0	226,576	142,072	44,412	7,383	19,473	213,340
2017	68,436	35,177	27,291	46,009	32,711	98,773	20,013	0	328,410	58,931	44,301	27,400	4,036	134,668
2018	11,620	9,974	7,523	62,852	24,037	63,315	18,085	1,544	198,950	56,757	57,582	55,119	1,190	170,648
2019	12,089	7,182	4,336	39,927	37,993	32,404	9,429	2,332	145,692	45,612	26,848	30,491	3,190	106,141
2020	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Averages														
2011–2020	29,317	10,202	11,703	28,648	19,400	46,448	12,316	969	158,465	55,605	29,663	32,503	3,833	121,604
2016–2020	38,900	17,028	14,787	42,081	27,051	65,844	18,248	969	224,907	75,843	43,286	30,098	6,972	156,199

Note: En dashes indicate no data. NA indicates insufficient data to calculate averages. ADF&G test fishery sales not included.

^a Combined Statistical Areas 334-11 and 334-12 in District 1, and 334-21 and 334-22 in District 2 for confidentiality.

^b Statistical Area 334-19 was created in 2016.

Appendix D13.—Commercial fall chum salmon sales and estimated harvest by statistical area, District 4, upper Yukon management area, 2001–2021.

Year	334-46 ^a			334-42			334-43			Total		
	Number ^b	Roe ^c	Harvest ^d	Number ^b	Roe ^c	Harvest ^d	Number ^b	Roe ^c	Harvest ^d	Number ^b	Roe ^c	Harvest ^d
2001 ^e	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	—	—	—	1,315	0	1,315	1,315	0	1,315
2004	—	—	—	—	—	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—	—	—	—	—	—
2006	0	0	0	—	—	—	—	—	—	0	0	0
2007	—	—	—	—	—	—	—	—	—	—	—	—
2008	0	0	0	—	—	—	—	—	—	0	0	0
2009	—	—	—	—	—	—	—	—	—	—	—	—
2010	—	—	—	—	—	—	—	—	—	—	—	—
2011	—	—	—	—	—	—	—	—	—	—	—	—
2012	811	0	811	—	—	—	—	—	—	811	0	811
2013	—	—	—	—	—	—	—	—	—	—	—	—
2014	—	—	—	—	—	—	—	—	—	—	—	—
2015	—	—	—	—	—	—	—	—	—	—	—	—
2016	—	—	—	—	—	—	—	—	—	—	—	—
2017	1,402	0	1,402	—	—	—	—	—	—	1,402	0	1,402
2018	596	0	596	—	—	—	—	—	—	596	0	596
2019	—	—	—	—	—	—	—	—	—	—	—	—
2020	—	—	—	—	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—
Averages												
2011–2020	936	0	936	NA	NA	NA	NA	NA	NA	936	0	936
2016–2020	999	0	999	NA	NA	NA	NA	NA	NA	999	0	999

Note: En dashes indicate no data. NA indicates insufficient data to calculate average.

^a In Subdistrict 4-A (Statistical Area 334-41), from 1977 to 2001, commercial fishing, by regulation, was not allowed during fall season. Additionally, in 1990, Subdistrict 4-A (Statistical Area 334-41) was subdivided into Statistical Areas 334-44, 334-45, and 334-46.

^b Harvest reported in numbers of fish sold in the round.

^c Pounds of salmon roe sold.

^d The estimated harvest is the fish sold in the round plus the estimated number of females to produce the roe sold. Since 1990, the estimated number of females that produce the roe sold is based on a District 4 sampling program that estimated average roe weight per female by period, by statistical area and gear type.

^e Guideline harvest range (GHR) included District 4-A.

Appendix D14.—Commercial fall chum salmon sales and estimated harvest by statistical area, Subdistricts 5-A, 5-B, and 5-C, upper Yukon management area, 2001–2021.

Year	334-51			334-52			334-53			Total		
	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	—	—	—	—	—	—	—	—	—
2004	0	0	0	—	—	—	—	—	—	0	0	0
2005	—	—	—	0	0	0	0	0	0	0	0	0
2006	—	—	—	—	—	—	10,030	—	10,030	10,030	0	10,030
2007	—	—	—	385	—	385	42	—	42	427	0	427
2008	0	0	0	4,556	—	4,556	0	0	0	4,556	0	4,556
2009	—	—	—	—	—	—	—	—	—	—	—	—
2010	—	—	—	—	—	—	—	—	—	—	—	—
2011	—	—	—	1,246	—	1,246	0	0	0	1,246	0	1,246
2012	—	—	—	2,419	—	2,419	0	0	0	2,419	0	2,419
2013	—	—	—	1,041	—	1,041	0	0	0	1,041	0	1,041
2014	—	—	—	1,264	—	1,264	0	0	0	1,264	0	1,264
2015	—	—	—	1,048	—	1,048	0	0	0	1,048	0	1,048
2016	—	—	—	7,542	—	7,542	0	0	0	7,542	0	7,542
2017	—	—	—	1,952	138	1,952 ^d	0	0	0	1,952	138	1,952 ^d
2018	—	—	—	896	—	896	0	0	0	896	0	896
2019	—	—	—	900	0	900	—	—	—	900	0	900
2020	—	—	—	—	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—
Averages												
2011–2020	NA	NA	NA	2,034	NA	2,034	0	0	0	2,034	15	2,034
2016–2020	NA	NA	NA	2,823	NA	2,823	0	0	0	2,823	35	2,823

Note: En dashes indicate no commercial fishing activity occurred. NA indicates insufficient data to generate average.

^a Harvest reported in numbers of fish sold in the round.

^b Pounds of salmon roe sold.

^c Harvest is the fish sold in the round plus the estimated number of females to produce the roe sold. Since 1990, the estimated number of females that produce the roe sold is based on a District 5 sampling program that estimated average roe weight per female by period.

^d The number of females harvested to produce the roe sold is included in the subsistence harvest estimate.

Appendix D15.—Commercial fall chum salmon sales and estimated harvest by statistical area, District 6, upper Yukon management area, 2001–2021.

Year	334-61			334-62			334-63			Total		
	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	3,778	0	3,778	317	0	317	4,095	0	4,095
2004	—	—	—	3,450	0	3,450	—	—	—	3,450	0	3,450
2005	—	—	—	49,637	0	49,637	—	—	—	49,637	0	49,637
2006	—	—	—	23,353	0	23,353	—	—	—	23,353	0	23,353
2007	—	—	—	15,572	0	15,572	—	—	—	15,572	0	15,572
2008	4,029	—	4,029	1,706	0	1,706	—	—	—	5,735	0	5,735
2009	1,286	545	1,893	—	—	—	—	—	—	1,286	545	1,893
2010	—	—	—	1,735	0	1,735	—	—	—	1,735	0	1,735
2011	—	—	—	9,267	0	9,267	—	—	—	9,267	0	9,267
2012	—	—	—	17,336	0	17,336	—	—	—	17,336	0	17,336
2013	—	—	—	24,148	0	24,148	—	—	—	24,148	0	24,148
2014	1,568	0	1,568	1,800	0	1,800	—	—	—	3,368	0	3,368
2015	808	0	808	14,771	0	14,771	67	0	67	15,646	0	15,646
2016	0	0	0	12,990	0	12,990	5,063	0	5,063	18,053	0	18,053
2017	0	0	0	8,207	290	8,587 ^d	14,683	0	14,683	22,890	290	23,270
2018	0	0	0	3,498	0	3,498	13,200	0	13,200	16,698	0	16,698
2019	0	0	0	8,093	0	8,093	7,534	0	7,534	15,627	0	15,627
2020	—	—	—	—	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—
Averages												
2011–2020	396	0	396	11,123	32	11,166	8,109	0	8,109	15,893	32	15,935
2016–2020	0	0	0	8,197	73	8,292	10,120	0	10,120	18,317	73	18,412

Note: En dashes indicate no data.

^a Harvest reported in numbers of fish sold in the round.

^b Pounds of salmon roe sold.

^c Harvest is the fish sold in the round plus the estimated number of females to produce the roe sold. Since 1990, the estimated number of females that produce the for sold is based on a District 6 sampling program that estimated average roe weight per female by period.

^d Includes headed and gutted fish sold and used to produce roe.

Appendix D16.—Commercial coho salmon harvest (in numbers of fish) by statistical area, lower Yukon, 2001–2021.

Year	District 1									District 2				
	334-11 and -12 ^a	334-13	334-14	334-15	334-16	334-17	334-18	334-19 ^b	Total	334-21 and -22 ^a	334-23	334-24	334-25	Total
2001	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2003	4,890	305	656	1,939	0	576	1,391	—	9,757	—	—	—	—	—
2004	900	201	290	0	0	50	142	—	1,583	—	—	—	—	—
2005	4,347	1,069	4,020	1,560	17,728	6,615	1,194	—	36,533	—	—	—	—	—
2006	3,041	2,467	2,315	3,508	15,280	10,196	2,516	—	39,323	9,388	3,745	1,349	0	14,482
2007	1,320	2,361	1,983	993	6,331	7,091	1,641	—	21,720	16,549	3,253	1,685	0	21,487
2008	3,157	1,024	1,274	838	2,456	3,712	1,485	—	13,946	9,351	4,594	4,680	621	19,246
2009	227	124	11	1,566	2,486	1,493	87	—	5,994	1,455	100	8	19	1,582
2010	204	5	6	142	102	445	123	—	1,027	112	606	0	305	1,023
2011	5,278	1,851	4,696	9,424	9,101	12,724	2,261	—	45,335	14,275	3,705	5,987	217	24,184
2012	3,772	331	1,229	8,683	7,241	14,523	3,978	—	39,757	15,498	5,584	7,981	0	29,063
2013	5,028	1,248	2,360	4,810	2,609	9,993	1,258	—	27,306	14,992	7,225	8,911	330	31,458
2014	6,092	3,441	4,648	9,127	5,286	20,007	6,203	—	54,804	25,154	12,310	11,138	0	48,602
2015	18,627	2,606	3,897	8,589	9,072	19,200	4,038	—	66,029	27,623	14,355	11,027	1,855	54,860
2016	27,232	9,529	3,424	14,313	19,005	29,352	10,814	0	113,669	45,636	17,886	2,645	1,041	67,208
2017	16,508	5,529	1,771	10,685	28,437	27,993	5,059	0	95,982	20,125	7,035	5,940	177	33,277
2018	4,814	1,816	1,366	17,958	15,698	16,955	4,503	2,321	65,431	22,701	10,606	7,387	151	40,845
2019	2,811	948	810	9,040	11,506	10,118	3,809	1,579	40,621	8,442	3,652	3,132	396	15,622
2020	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Averages														
2011–2020	10,018	3,033	2,689	10,292	11,995	17,874	4,658	—	60,993	21,605	9,151	7,128	463	38,347
2016–2020	12,841	4,456	1,843	12,999	18,662	21,105	6,046	975	78,926	24,226	9,795	4,776	441	39,238

Note: En dashes indicate no data. NA indicates insufficient data to calculate averages. ADF&G test fishery sales not included.

^a Combined Statistical Areas 334-11 and 334-12 in District 1, and 334-21 and 334-22 in District 2 for confidentiality.

^b Statistical Area 334-19 was created in 2016.

Appendix D17.—Commercial coho salmon sales and estimated harvest by statistical area, District 6, upper Yukon management area, 2001–2021.

Year	334-61			334-62			334-63			Total		
	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c	Number ^a	Roe ^b	Harvest ^c
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	14,984	0	14,984	135	0	135	15,119	0	15,119
2004	—	—	—	18,649	0	18,649	—	—	—	18,649	0	18,649
2005	—	—	—	21,778	0	21,778	—	—	—	21,778	0	21,778
2006	—	—	—	11,137	0	11,137	—	—	—	11,137	0	11,137
2007	—	—	—	1,368	0	1,368	—	—	—	1,368	0	1,368
2008	2,160	0	2,160	248	0	248	—	—	—	2,408	0	2,408
2009	457	258	742	—	—	—	—	—	—	457	258	742
2010	—	—	—	1,700	0	1,700	—	—	—	1,700	0	1,700
2011	—	—	—	6,784	0	6,784	—	—	—	6,784	0	6,784
2012	—	—	—	5,335	0	5,335	—	—	—	5,335	0	5,335
2013	—	—	—	7,439	0	7,439	—	—	—	7,439	0	7,439
2014	318	0	318	968	0	968	—	—	—	1,286	0	1,286
2015	447	0	447	8,361	0	8,361	3	0	3	8,811	0	8,811
2016	0	0	0	13,285	0	13,285	7,266	0	7,266	20,551	0	20,551
2017	0	0	0	3,515	126	3,735 ^d	5,921	0	5,921	9,436	126	9,656 ^d
2018	0	0	0	1,256	0	1,256	3,058	0	3,058	4,314	0	4,314
2019	—	—	—	1,155	0	1,155	1,193	0	1,193	2,348	0	2,348
2020	—	—	—	—	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—
Averages												
2011–2020	NA	NA	NA	5,344	14	5,369	3,488	0	3,488	7,367	14	7,392
2016–2020	NA	NA	NA	4,803	32	4,858	4,360	0	4,360	9,162	32	9,217

Note: En dashes indicate no data.

^a Harvest reports in numbers of fish sold in the round.

^b Pounds of salmon roe sold.

^c Harvest is the fish sold in the round plus the estimated number of females to produce the roe sold. Since 1990, the estimated number of females that produce the roe sold is based on a District 6 sampling program that estimated average roe weight per female by period.

^d Includes headed and gutted fish sold and used to produce roe.

Appendix D18.—Commercial pink salmon harvest by statistical area, lower Yukon management area, 2001–2021.

Year	District 1									District 2				
	334-11 and 334-12 ^a	334-13	334-14	334-15	334-16	334-17	334-18	334-19 ^b	Total	334-21 and 334-22 ^a	334-23	334-24	334-25	Total
2001	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2002	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2008	5,469	858	1,095	2,376	1,858	1,441	294	—	13,391	0	0	0	0	0
2009	0	0	0	0	0	0	0	—	0	13,391	0	0	0	13,391
2010	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	—	0	0	0	0	0	0
2014	34,216	2,265	3,391	3,318	56	5,678	393	—	49,317	0	5	0	0	5
2015	6,623	44	72	187	248	100	52	—	7,326	49,317	0	0	0	49,317
2016	78,196	7,173	3,934	7,758	12,585	14,469	955	0	125,070	7,326	0	0	0	7,326
2017	0	0	0	0	0	0	0	0	0	125,070	0	0	0	125,070
2018	20,164	1,253	430	5,815	4,248	5,490	1,056	0	38,456	0	11	1	0	12
2019	1,412	521	66	1,325	6,229	780	314	0	10,647	38,456	23	4	0	38,483
2020	4,001	52	6	494	135	46	0	111	4,845	0	0	0	0	0
2021	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Averages														
2011–2020	14,461	1,131	790	1,890	2,350	2,656	277	NA	23,566	22,017	4	1	0	22,021
2016–2020	20,755	1,800	887	3,078	4,639	4,157	465	22	35,804	34,170	7	1	0	34,178

Note: En dashes indicate no data.

^a Combined Statistical Areas 334-11 and 334-12 in District 1, and 334-21 and 334-22 in District 2 for confidentiality.

^b Statistical Area 334-19 was created in 2016.

Appendix D19.—Quotas and harvested cisco (in pounds and numbers) from the commercial whitefish fishery in the lower Yukon River, 2005–2021.

Year	Quota (number of fish) ^a	Permits fished	Number of deliveries	First delivery	Last delivery	Bering cisco			Least cisco			Total		
						Number	Pounds	Average wt.	Number	Pounds	Average wt.	Number	Pounds	Value
2005	5,029	13	34	10/15	10/28	241	362	1.50	1,694	2,294	1.35	3,176	6,315 ^b	\$6,315
2006	6,127	19	61	9/8	9/21	4,497	5,519	1.23	69	81	1.17	6,901	11,263 ^b	\$8,431
2007	4,910	23	42	9/26	10/1	2,451	2,951	1.20	—	—	—	4,644	9,459 ^b	\$9,002
2008	9,270	16	70	9/22	10/2	8,642	9,380	1.09	695	692	1.00	9,337	10,072	\$10,072
2009	13,972	29	110	9/16	9/26	9,185	9,903	1.08	750	763	1.02	9,935	10,666	\$10,666
2010	14,138	22	68	9/15	10/20	13,929	14,785	1.06	420	439	1.05	14,349	15,224	\$22,836
2011	9,106	19	47	9/4	9/15	11,386	12,523	1.10	253	258	1.02	11,639	12,781	\$12,781
2012	13,132	20	65	9/8	9/18	11,099	12,705	1.14	231	237	1.03	11,330	12,942	\$12,942
2013	20,000	17	53	9/17	9/25	16,901	19,442	1.15	120	123	1.03	17,021	19,565	\$19,565
2014	25,000	25	132	9/11	9/22	25,604	31,268	1.22	42	50	1.19	25,646	31,318	\$46,977
2015	25,000	22	142	9/7	9/21	23,670	28,391	1.20	15	16	1.07	23,685	28,407	\$42,611
2016	25,000	24	163	9/13	9/24	26,329	30,764	1.17	13	12	0.92	26,342	30,776	\$46,164
2017	25,000	27	167	9/11	9/20	16,779	19,479	1.16	70	60	0.86	16,849	19,539	\$29,309
2018	35,000	19	145	9/13	9/26	26,571	30,937	1.16	113	53	0.47	26,684	30,990	\$46,485
2019	35,000	8	12	8/21	8/31	2,477	2,820	1.14	0	0	—	2,477	2,820	\$2,820
2020	35,000	0	0	—	—	0	0	—	0	0	—	0	0	—
2021	35,000	0	0	—	—	0	0	—	0	0	—	0	0	—
Averages														
2011–2020		18	93	9/8	9/19	16,082	18,833	1.16	86	81	0.95	16,167	18,914	\$28,850
2016–2020		16	97	9/6	9/17	14,431	16,800	1.16	39	25	0.75	14,470	16,825	\$31,195

Note: the whitefish commercial fishery started in 2005. En dashes indicate no data.

^a From 2005 to 2012, quota was based on number of pounds and was 10,000 pounds, except for 2009, 2010, and 2012 when the quota was 15,000 pounds. Quota from 2005–2012 is calculated from pounds allocated and average total weight. Quota determined in numbers of fish starting in 2013.

^b Totals include Bering cisco, least cisco, sheefish, and unidentified whitefish that were also sold.

Appendix D20.—Freshwater finfish sales during the commercial salmon fishing season by district, Yukon management area, 2001–2021.

Year	Lower Yukon management area permits sold whitefish ^a	Lower Yukon management area		Upper Yukon management area permits that sold whitefish ^a	District 4		District 5				District 6	
		Sheefish			Whitefish		Whitefish		Sheefish		Whitefish	
		Number	Pounds		Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	1	1	17	2	0	0	0	0	0	0	60	120
2003	0	0	0	7	40 ^b	113	0	0	0	0	129	297
2004	0	0	0	6	—	—	4	15	0	0	53	112
2005	0	0	0	3	—	—	0	0	0	0	66 ^b	175
2006	0	0	0	3	—	—	0	0	0	0	99	397
2007	15	29	457	2	0	0	0	0	0	0	55	152
2008	0	0	0	3	0	0	271	264	38	338	95 ^c	292
2009	0	0	0	0	0	0	—	—	—	—	0	0
2010	0	0	0	2	0	0	—	—	—	—	18	72
2011	0	0	0	2	—	—	0	0	0	0	37	148
2012	0	0	0	1	0	0	0	0	0	0	10	25
2013	0	0	0	1	0	0	0	0	0	0	22	56
2014	0	0	0	2	0	0	5 ^d	20	38	456	0	0
2015	0	0	0	2	—	—	11	30	45	515	300	811
2016	0	0	0	0	—	—	0	0	0	0	0	0
2017	0	0	0	2	0	0	0	0	0	0	128	635
2018	0	0	0	2	0	0	0	0	0	0	516	3,014
2019	0	0	0	2	—	—	0	0	0	0	451	2,074
2020	0	0	0	0	—	—	—	—	—	—	—	—
2021	—	—	—	—	—	—	—	—	—	—	—	—
Averages												
2011–2020	0	0	0	2	NA	NA	0	6	9	108	163	751
2016–2020	0	0	0	2	NA	NA	0	0	0	0	274	1,431

Note: En dashes indicate no data. NA indicates insufficient data to calculate an average. Commercial whitefish permits have not been issued in the upper Yukon management area since 1997.

^a Number of limited entry salmon permits that also sold whitefish.

^b A small number of sheefish or pike were also sold (less than 5 fish).

^c Sales do not include the number of fish; therefore, number of fish was estimated using average weight (3.07 pounds) from 2007 and 2010 in District 6.

^d Includes 3 humpback whitefish, 1 broad whitefish, and 1 unidentified whitefish.

Appendix D21.—Arctic lamprey commercial freshwater harvest, 2003–2021.

Year	Quota (pounds)	Permits fished	Lower Yukon		Upper Yukon		Total		Average weight (pounds) ^a	Price per pound	Harvest value
			Number	Pounds	Number	Pounds	Number	Pounds			
2003	44,080	38	92,890	23,960	99,624	25,697	192,513	49,657	0.258	1.25	\$62,071
2004	—	0	—	—	—	—	—	—	—	—	—
2005	5,000	0	—	—	—	—	—	—	—	—	—
2006	40,000	12	3,243	715	33,933	7,481	37,176	8,196	0.220	1.00	\$8,196
2007	47,080	1	2,109	465	191	42	191	42	0.220 ^b	1.00	\$42
2008	40,000	10	—	—	41,749	11,137	41,749	11,137	0.267	1.00	\$11,137
2009	44,080	15	—	—	48,117	14,745	49,634	15,210	0.306	1.24 ^c	\$18,546
2010	40,000	22	—	—	108,837	30,713	108,837	30,713	0.282	1.25	\$38,391
2011	44,080	3	—	—	2,660	783	2,660	783	0.294 ^d	1.25	\$979
2012	44,080	4	—	—	1,539	336	1,539	336	0.218	1.25	\$420
2013	44,080	11	—	—	45,805	11,613	45,805	11,613	0.254	1.25	\$14,516
2014	49,080	30	49,148	15,386	91,785	28,734	140,933	44,120	0.313	1.50	\$66,180
2015	44,080	18	12,373	2,755	149,371	33,260	161,744	36,015	0.223	1.50	\$54,022
2016	44,080	9	8,689	2,031	8,691	2,031	17,382	4,062	0.234	1.50	\$6,091
2017	44,080	0	—	—	—	—	—	—	—	—	—
2018	44,080	5	0	0	16,480	4,091	16,480	4,091	0.248 ^e	1.50	\$6,137
2019	44,092	0	—	—	—	—	—	—	—	—	—
2020	44,092	0 ^f	1,614	381	0	0	1,614	381	0.236 ^g	1.50	\$572
2021	44,092	0 ^f	1,610	380	0	0	380	380	0.236 ^g	1.00	\$380
Averages											
2011–2020		8	14,365	4,111	39,542	10,106	48,520	12,675	0.255	1.00	18,615
2016–2020		3	3,434	804	8,390	2,041	11,825	2,845	0.239	2.00	4,266

Note: En dashes indicate no data. Commercial Arctic lamprey fishery began in 2003.

^a Average weight of lamprey harvested in Grayling used to calculate number of lamprey harvested in the commercial fishery.

^b No harvest sampling was conducted; the average lamprey weight in Grayling from 2006 was used to calculate the number of lamprey harvested.

^c Average price per pound calculated by dividing total harvest value by total pounds of lamprey delivered. Harvesters in Marshal were paid \$1.00 per pound, harvesters in Grayling were paid \$1.25 per pound.

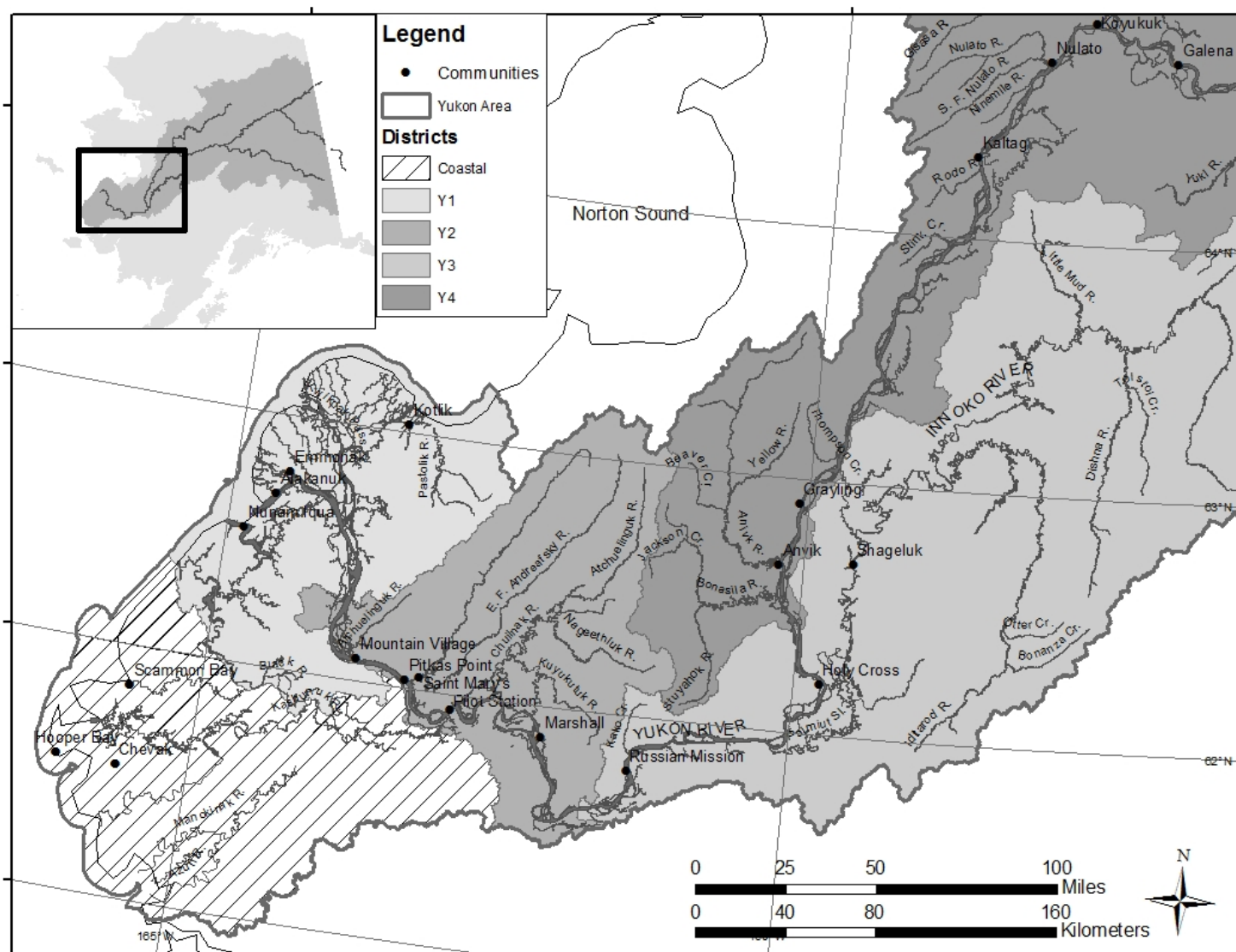
^d No harvest sampling was conducted; the average weight of lamprey collected in Grayling from 2009 and 2010 was used to calculate the number of lamprey harvested.

^e No harvest sampling was conducted; the average weight of lamprey collected in Grayling from 2012 to 2016 was used to calculate the number of lamprey harvested.

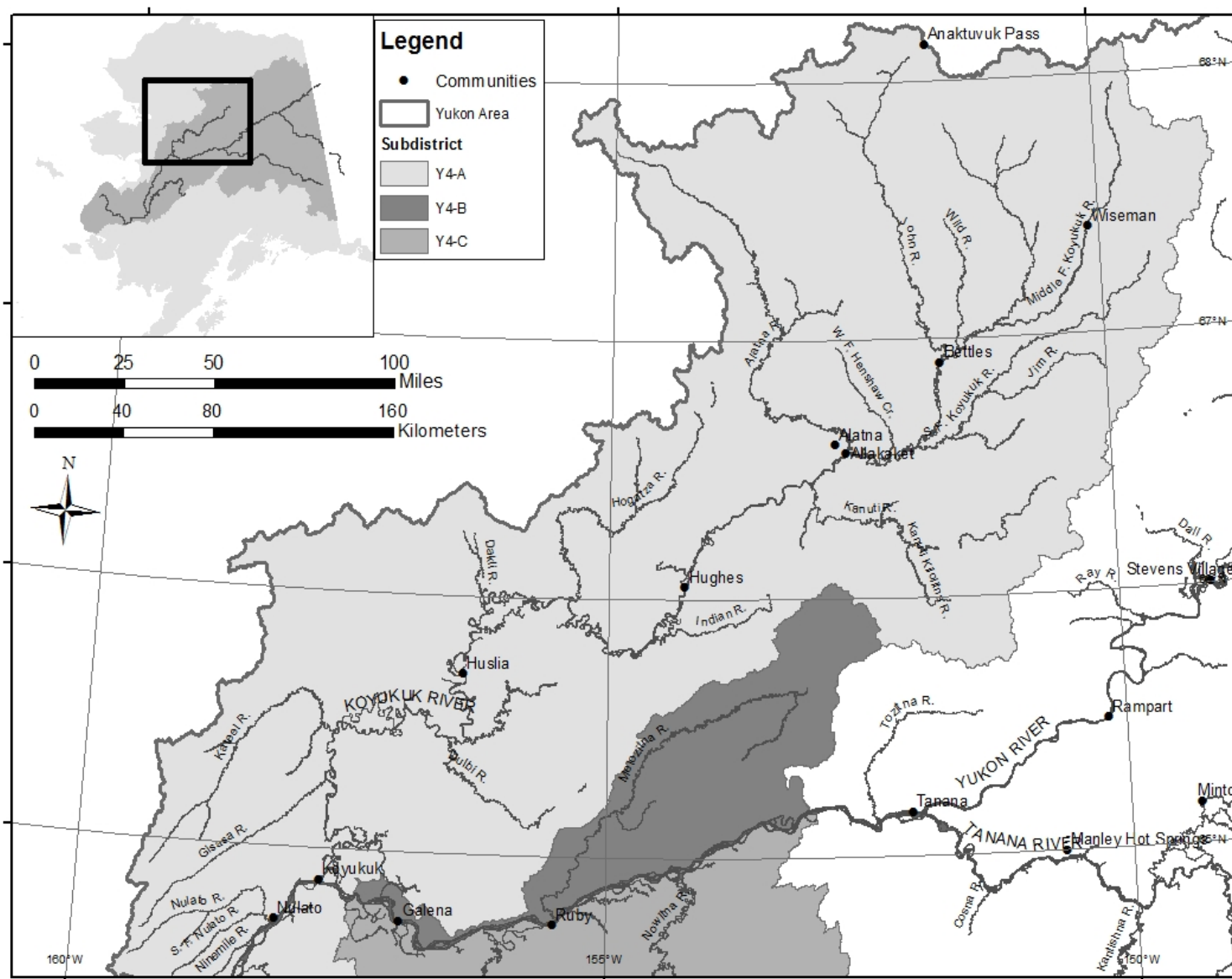
^f Lamprey delivered from test fishery in Emmonak.

^g No harvest sampling was conducted. Average weight of 0.236 pounds was used; value based on lamprey sampled in St. Mary's from 2014–2016.

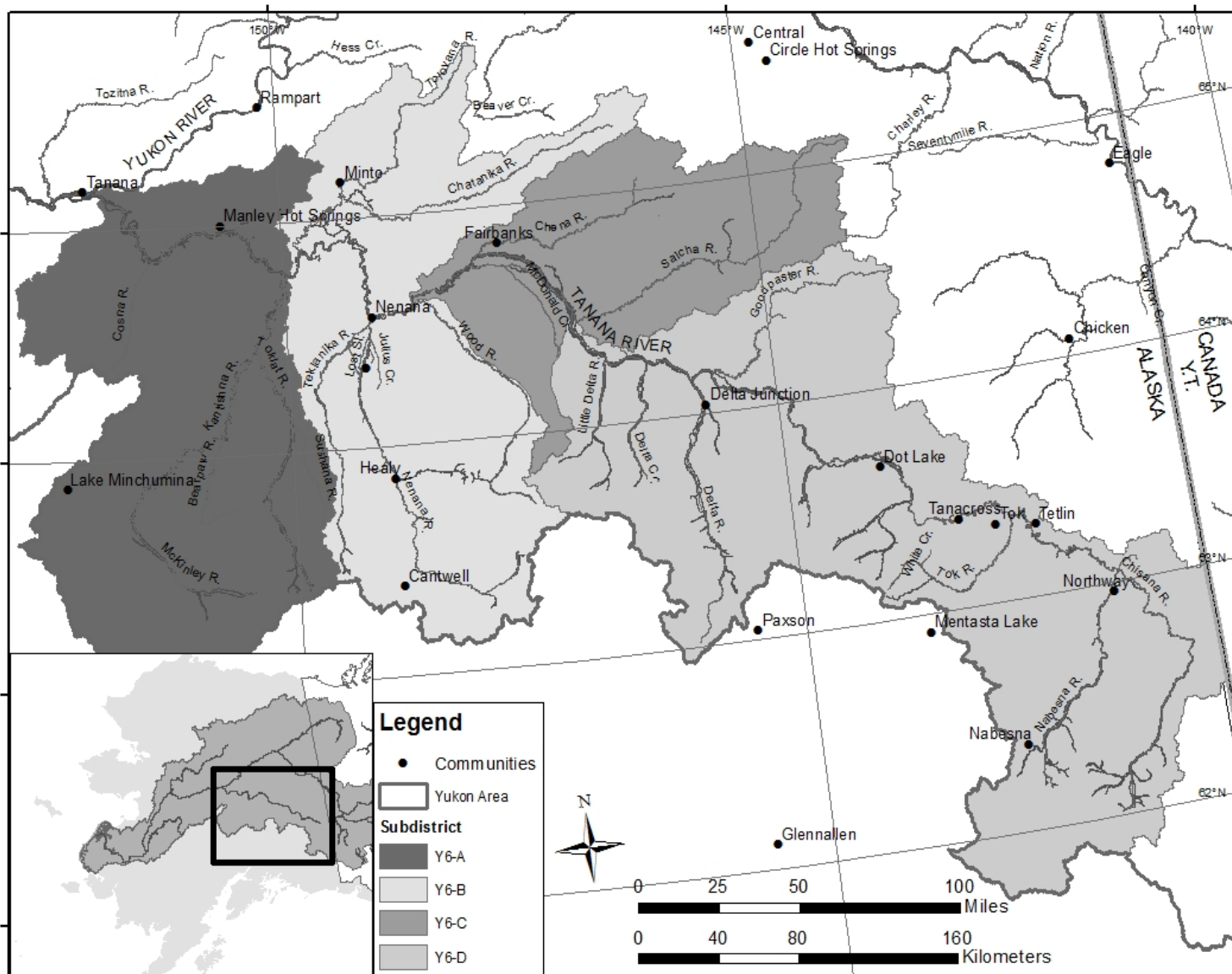
APPENDIX E: YUKON MANAGEMENT AREA LOCATIONS AND MAPS



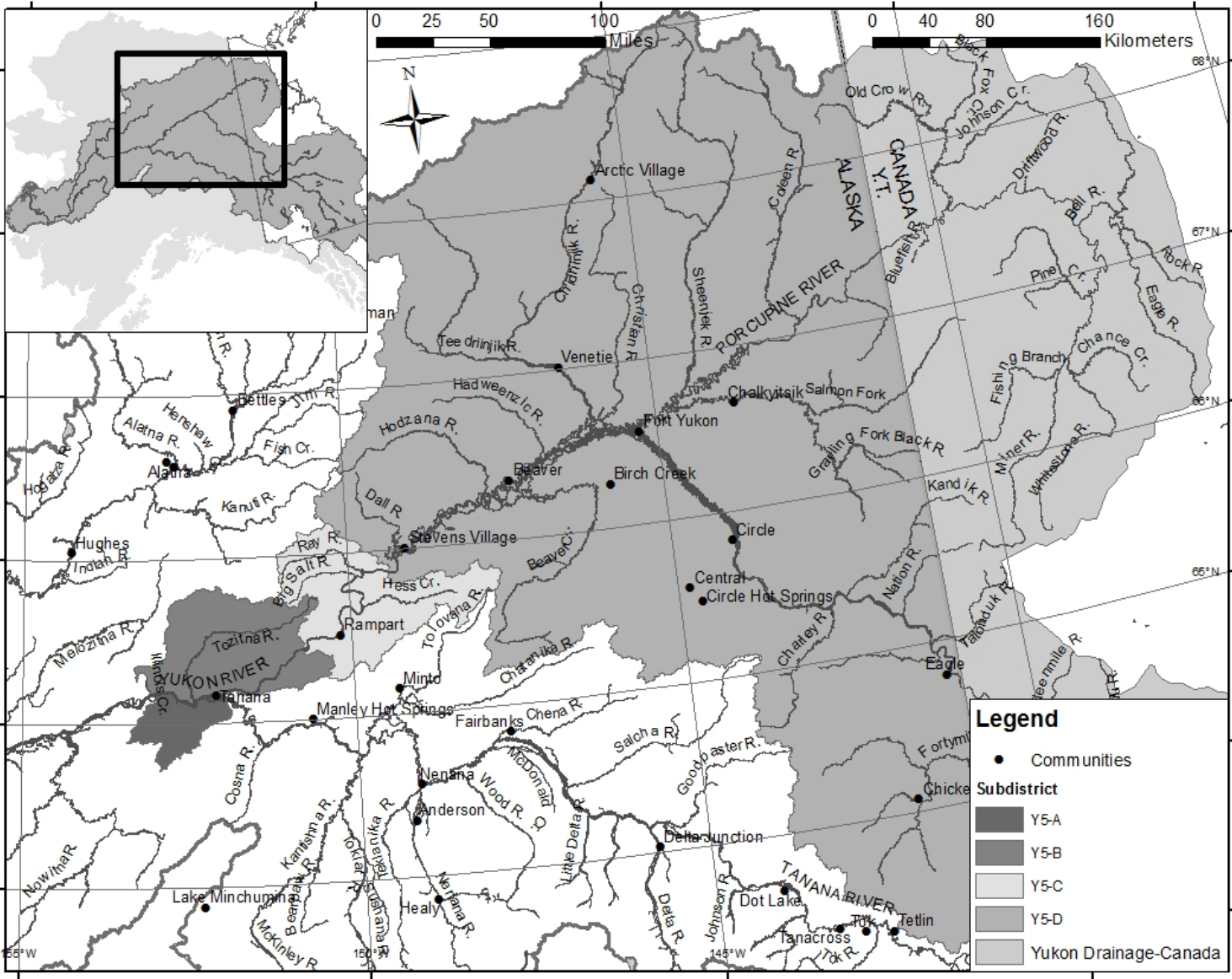
201



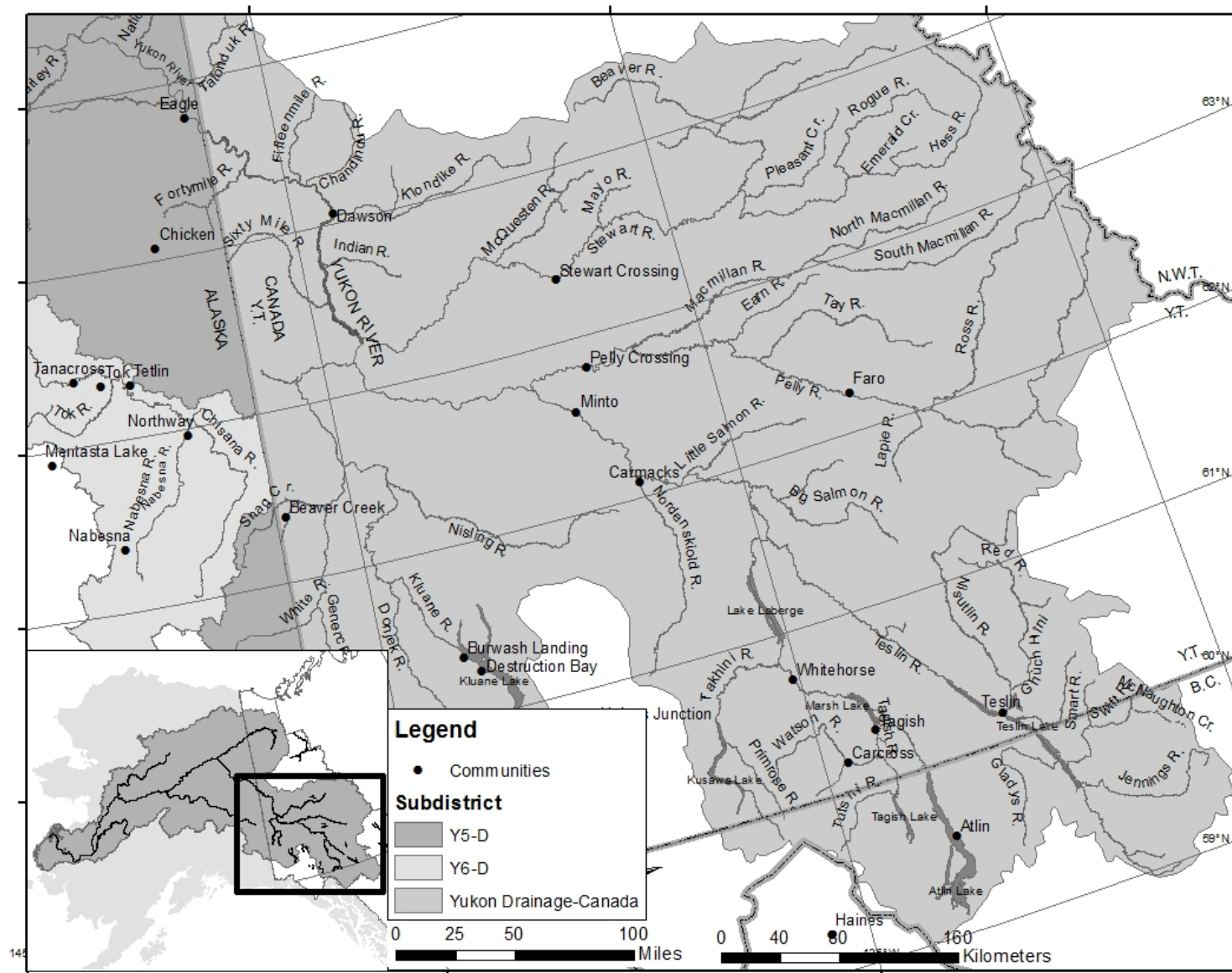
Appendix E3.—The Tanana River drainage.



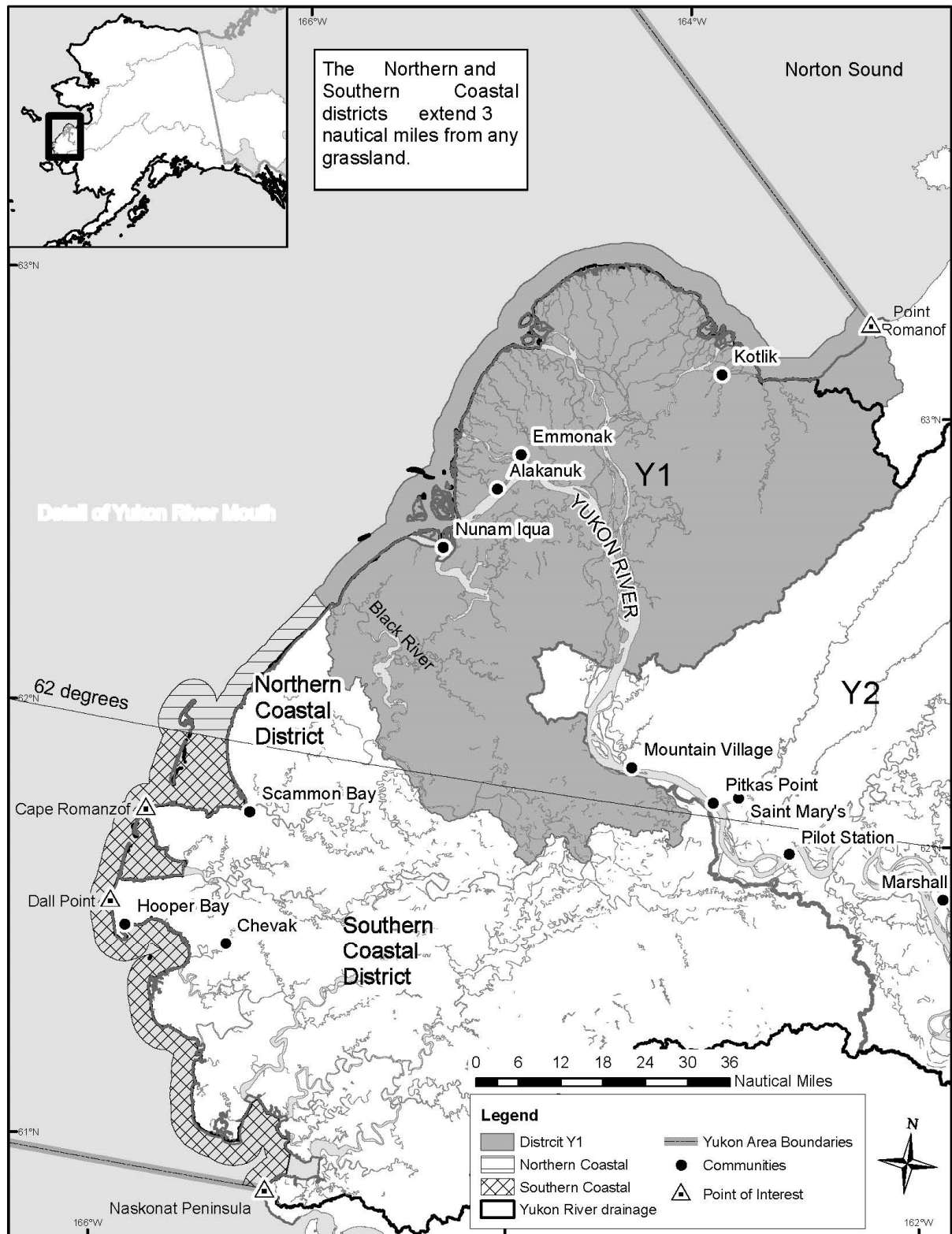
Appendix E4.—The middle Yukon River and Porcupine River drainages.



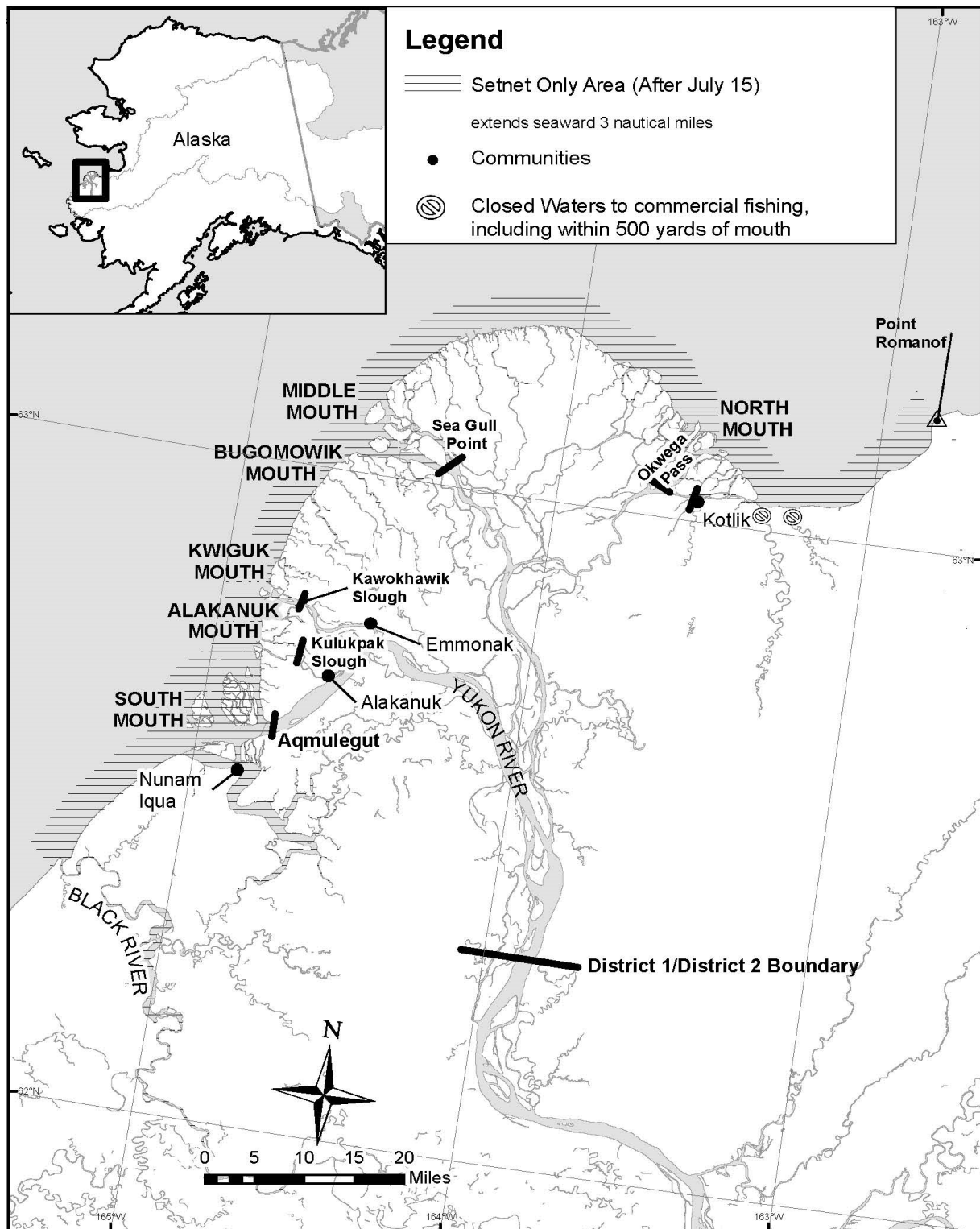
Appendix E5.—The upper Yukon River drainage in Canada.



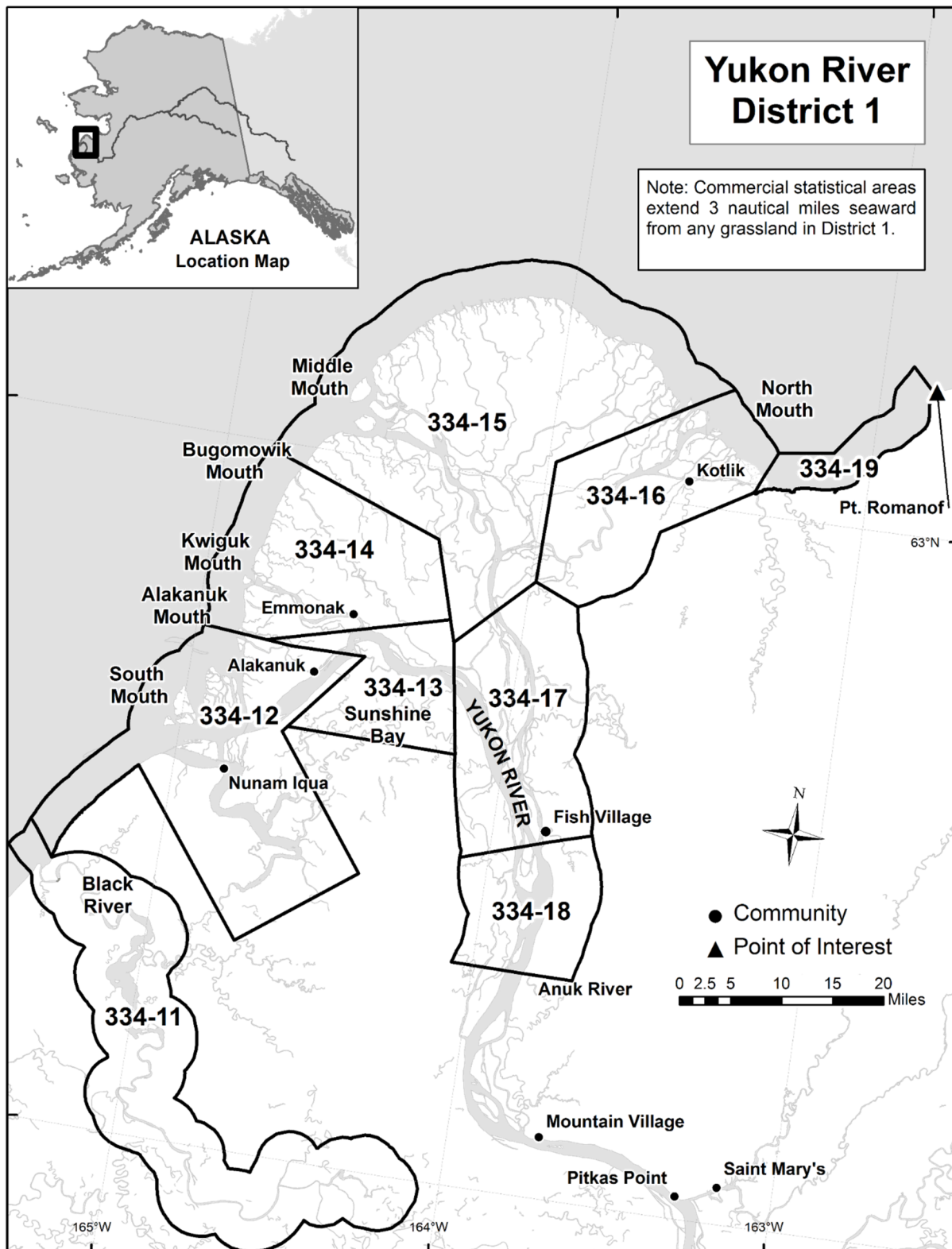
Appendix E6.—Coastal Districts and District 1, Yukon management area.



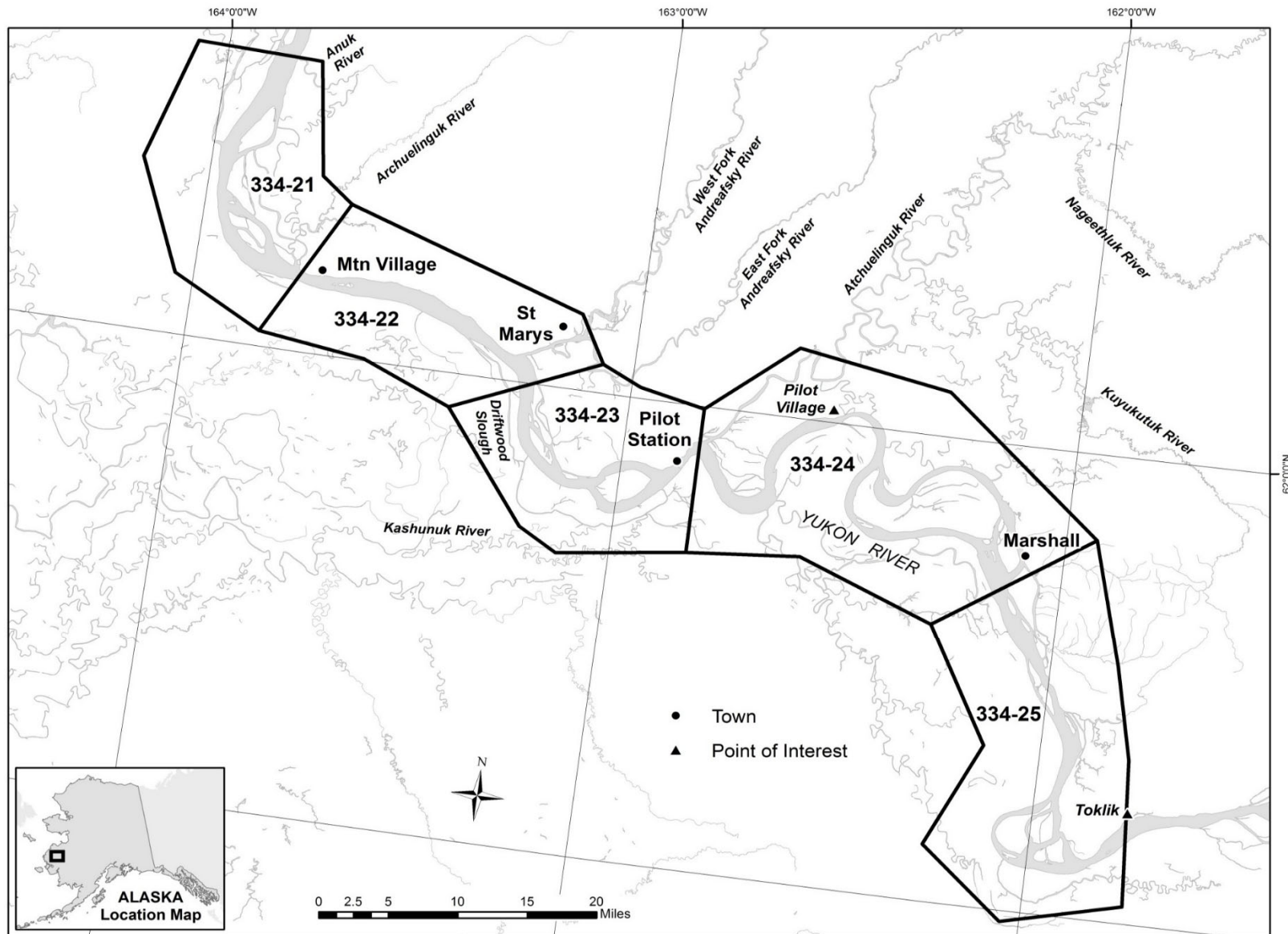
Appendix E7.—Set Gillnet Only Area of District 1, Yukon management area.



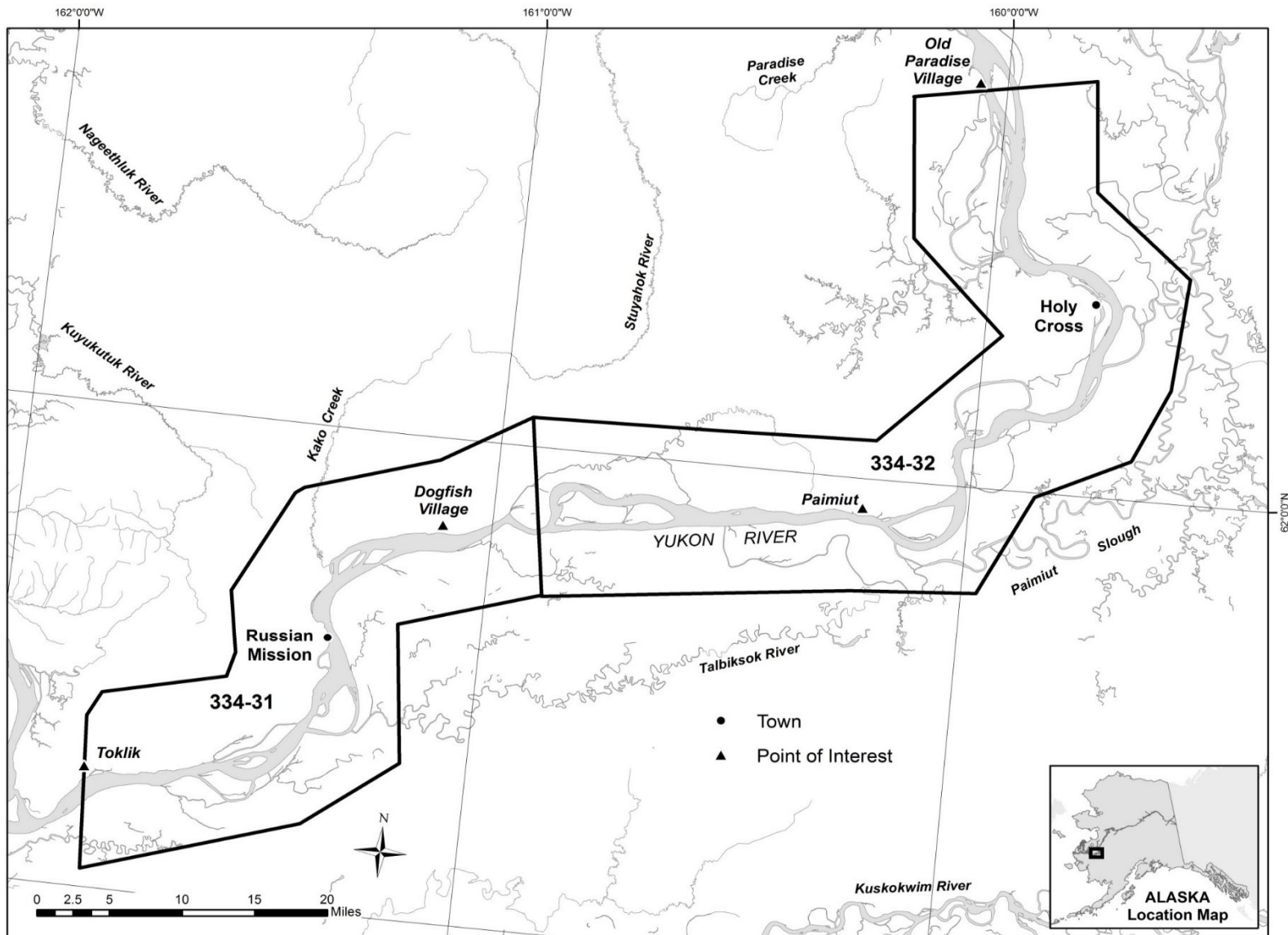
Appendix E8.—District 1 showing statistical areas, Yukon management area.



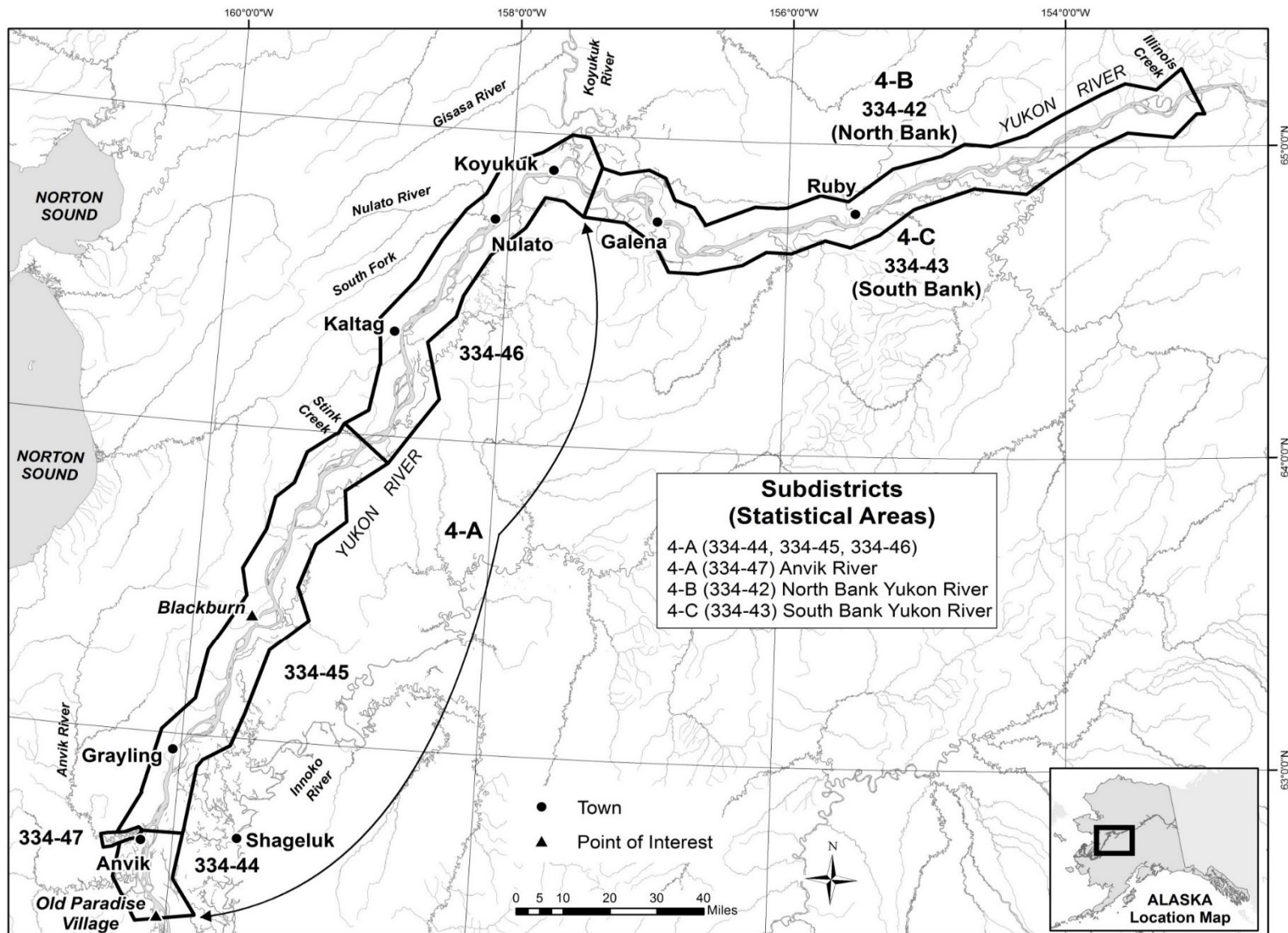
Appendix E9.—District 2 showing statistical areas, Yukon management area.



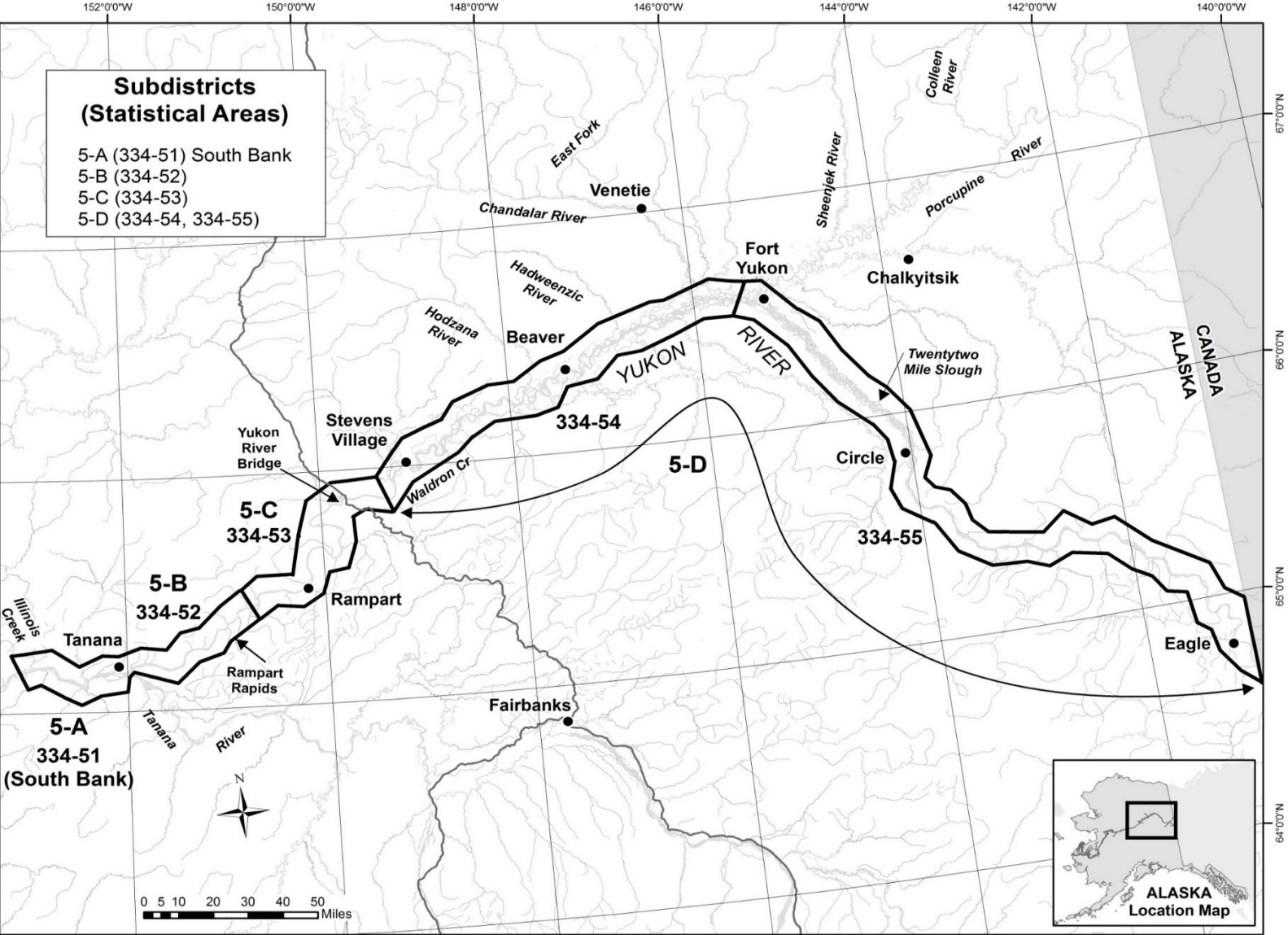
Appendix E10.—District 3 showing statistical areas, Yukon management area.



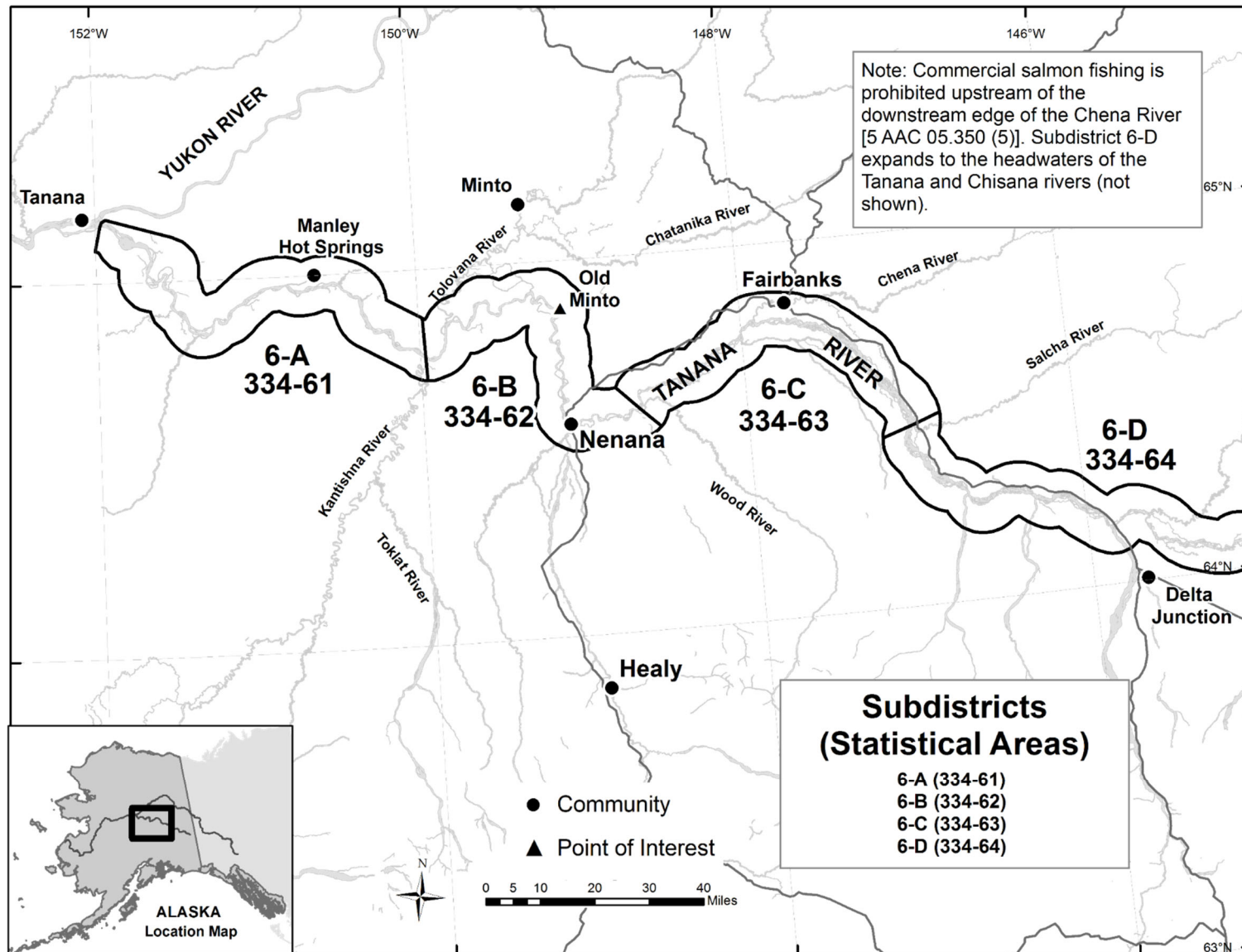
Appendix E11.—District 4 showing statistical areas, Yukon management area.



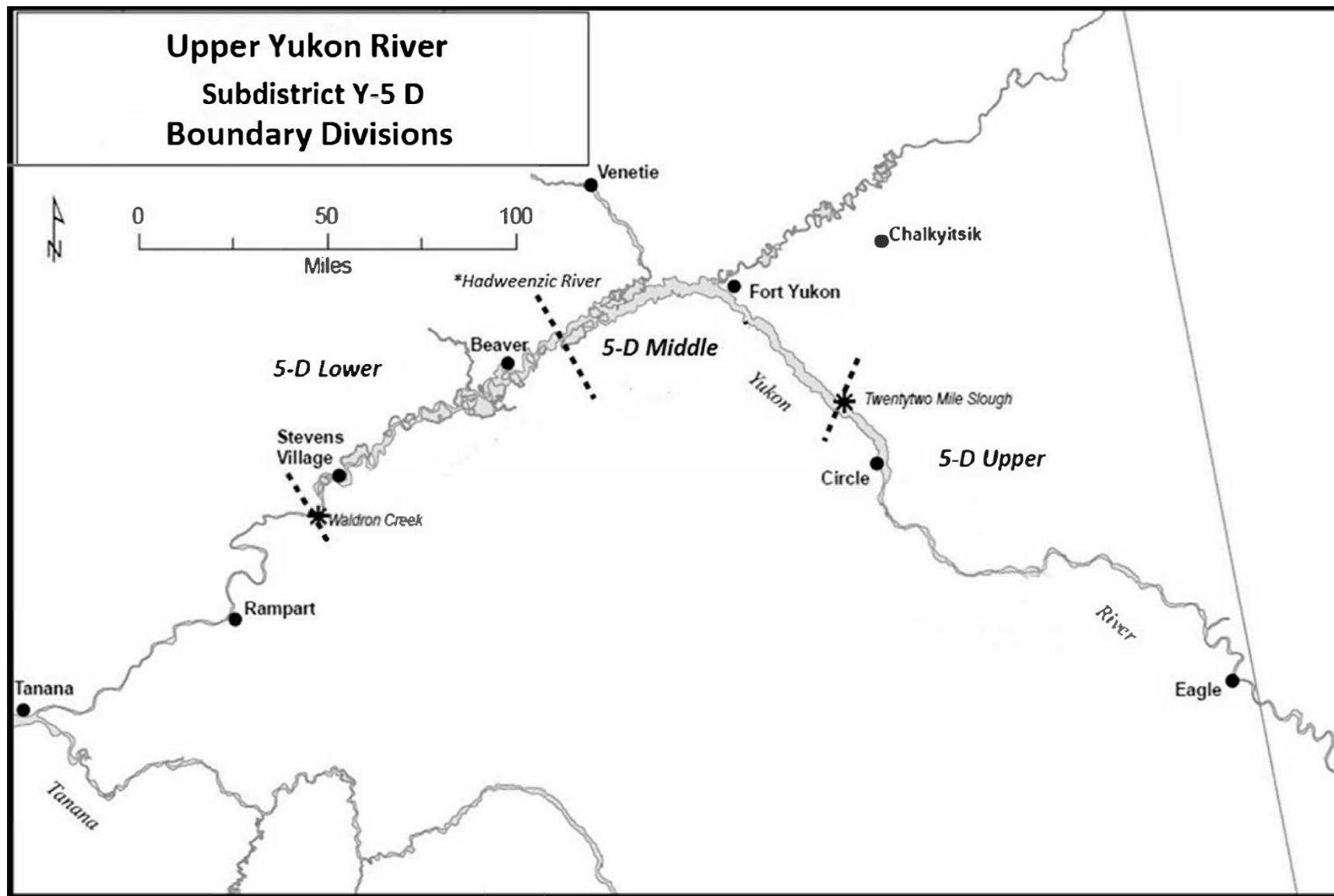
Appendix E12.—District 5 showing statistical areas, Yukon management area.



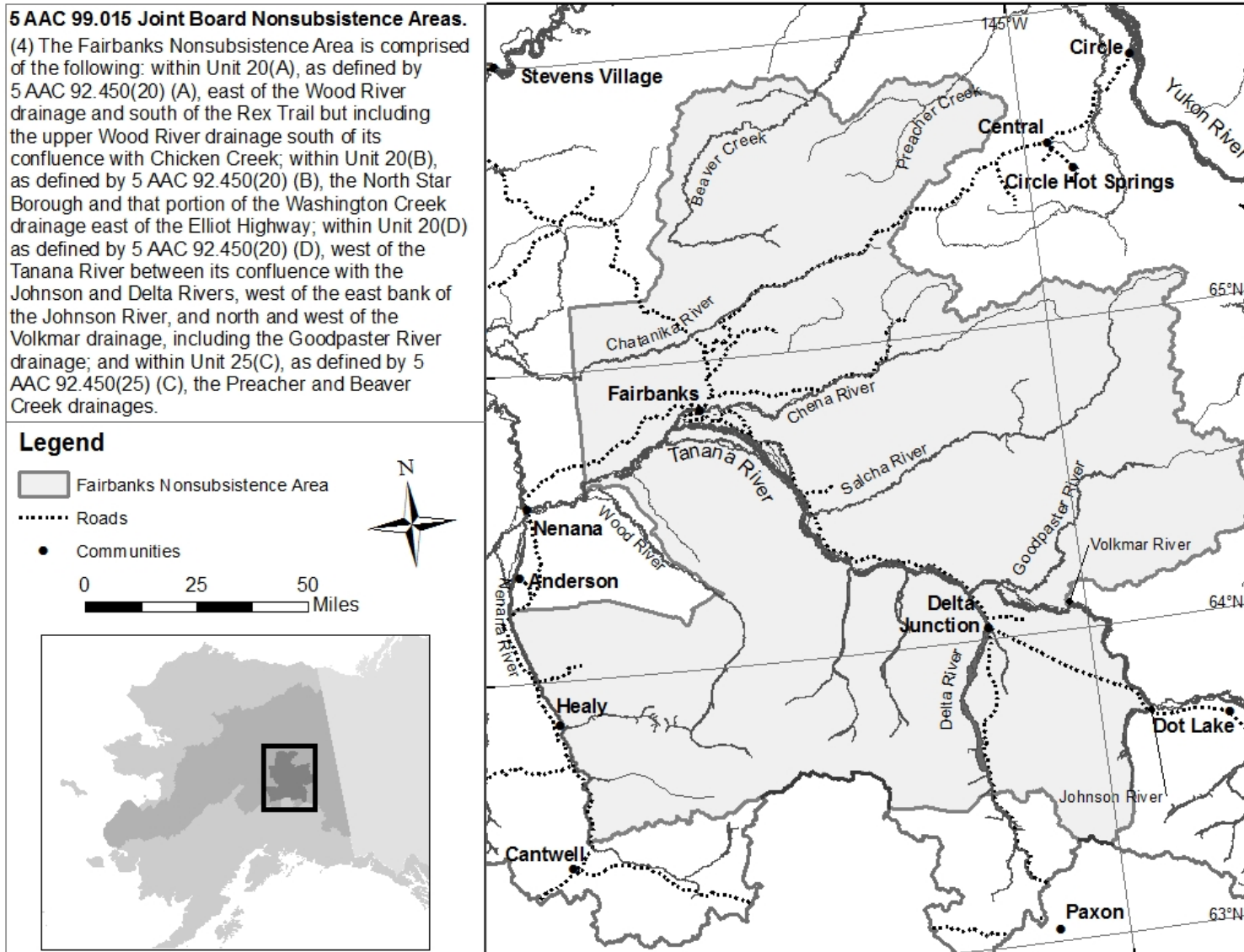
Appendix E13.—District 6 showing statistical areas, Yukon management area.



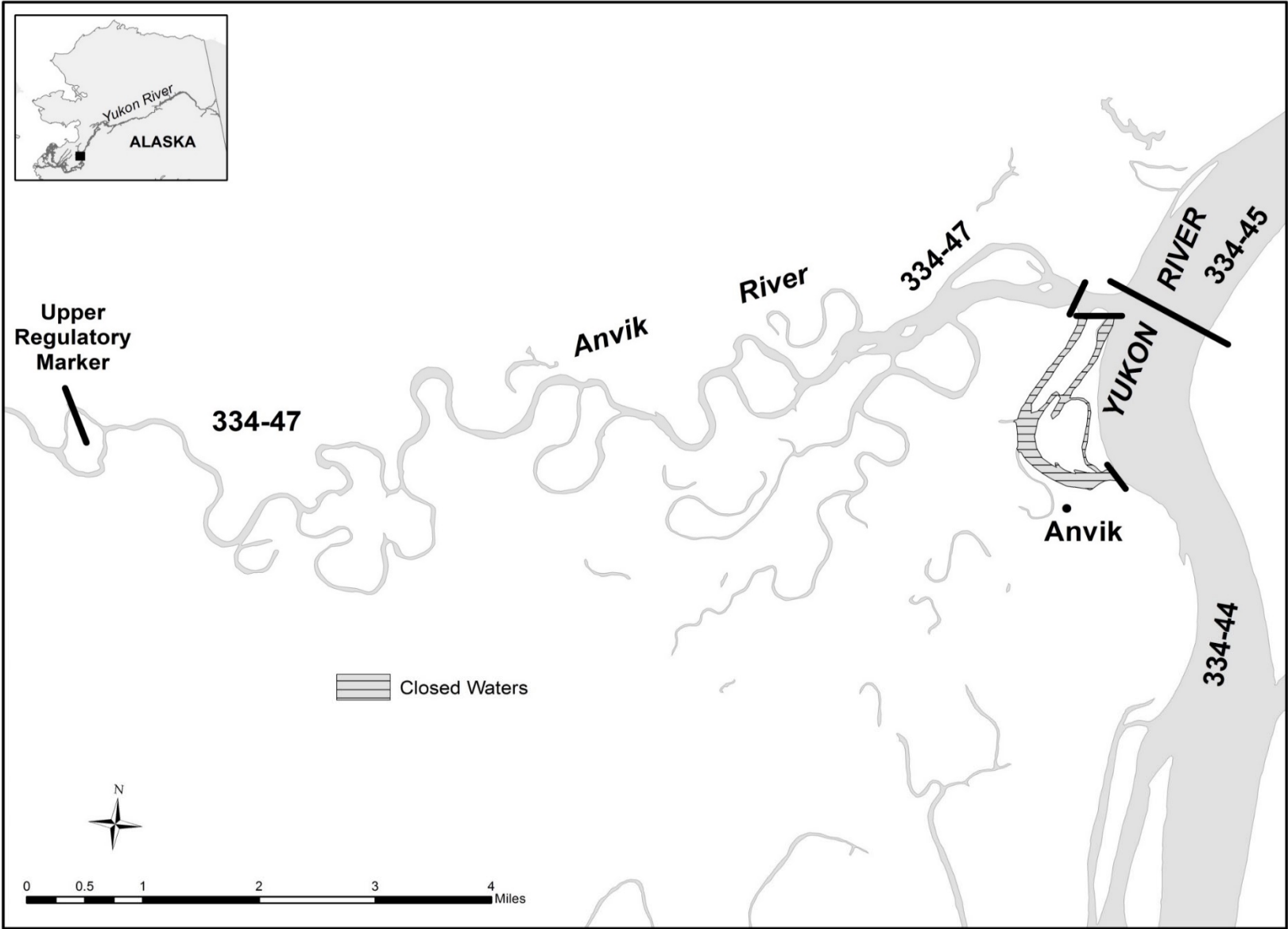
Appendix E14.—Subdistrict 5-D Boundary Divisions, Yukon management area.



Appendix E15.—The Fairbanks Nonsubsistence Area.



Appendix E16.—Anvik River Management Area, Yukon management area.



Appendix E17.—Waters open to commercial herring fishing in the Cape Romanzof District.

